

JANUARY 1957

# Contractors *and* Engineers Monthly



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JANUARY, 1933

VOLUME 25

NO. 1

TOM DIX, President      THEODORE REED KENDALL, Editor  
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**Remember your machines depreciate whether you use them or not. Watch new equipment and be prepared for CONSTRUCTION IN 1933.**

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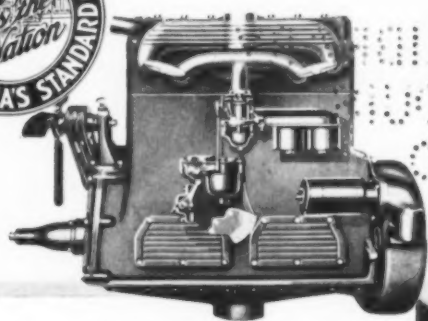
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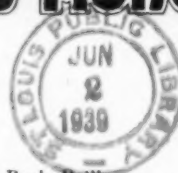
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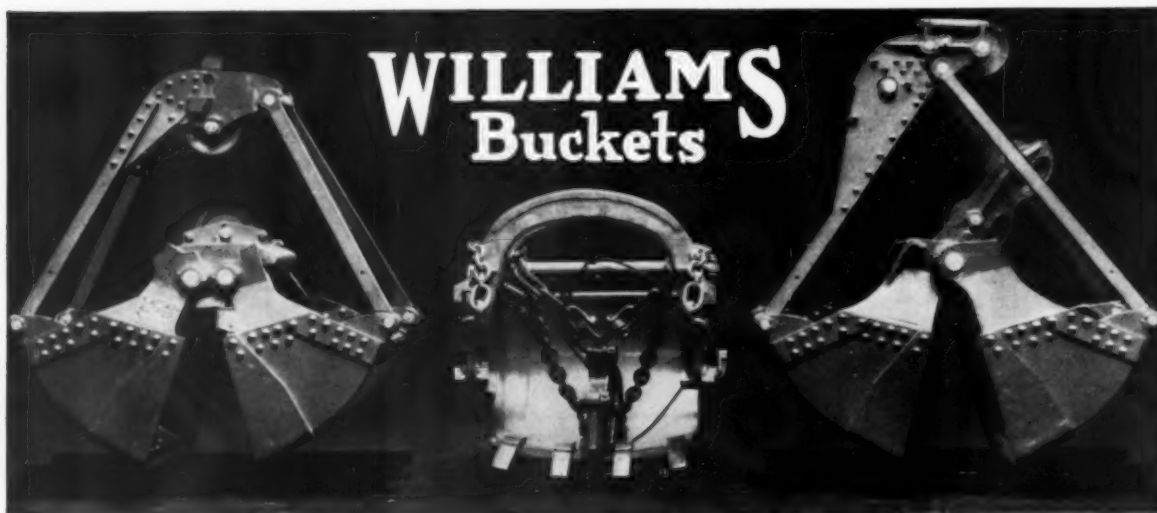
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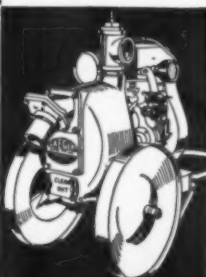
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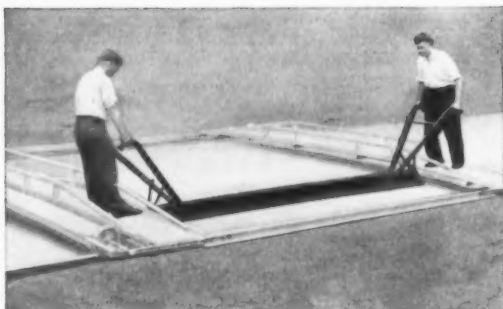
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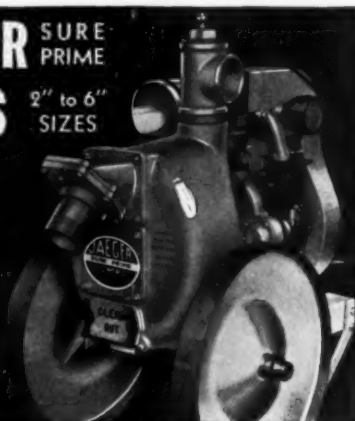
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JUNE, 1933

VOLUME 26 NO. 6

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# Contractors and Engineers Monthly

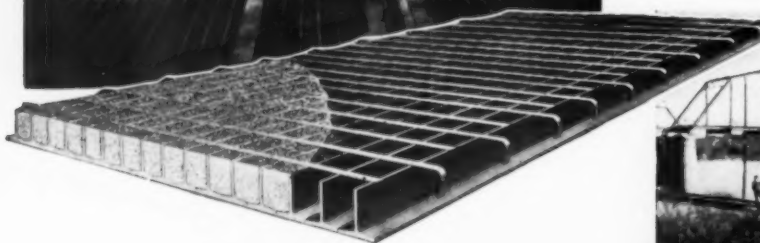
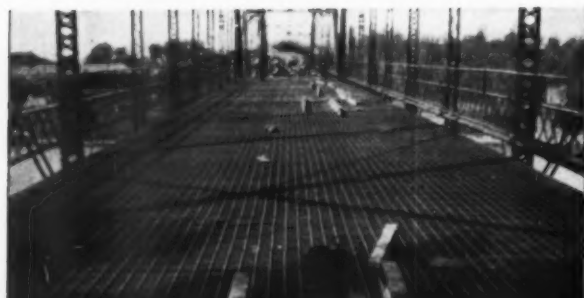
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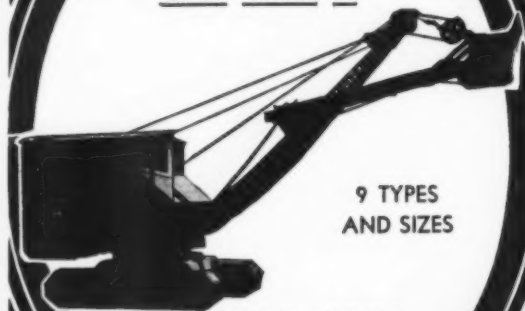
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**• It does everything  
but talk . . . and talk doesn't  
GET THE JOB DONE » » »**

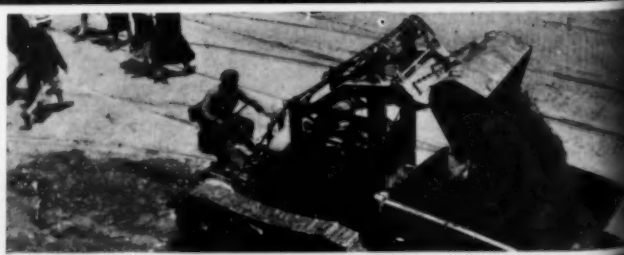


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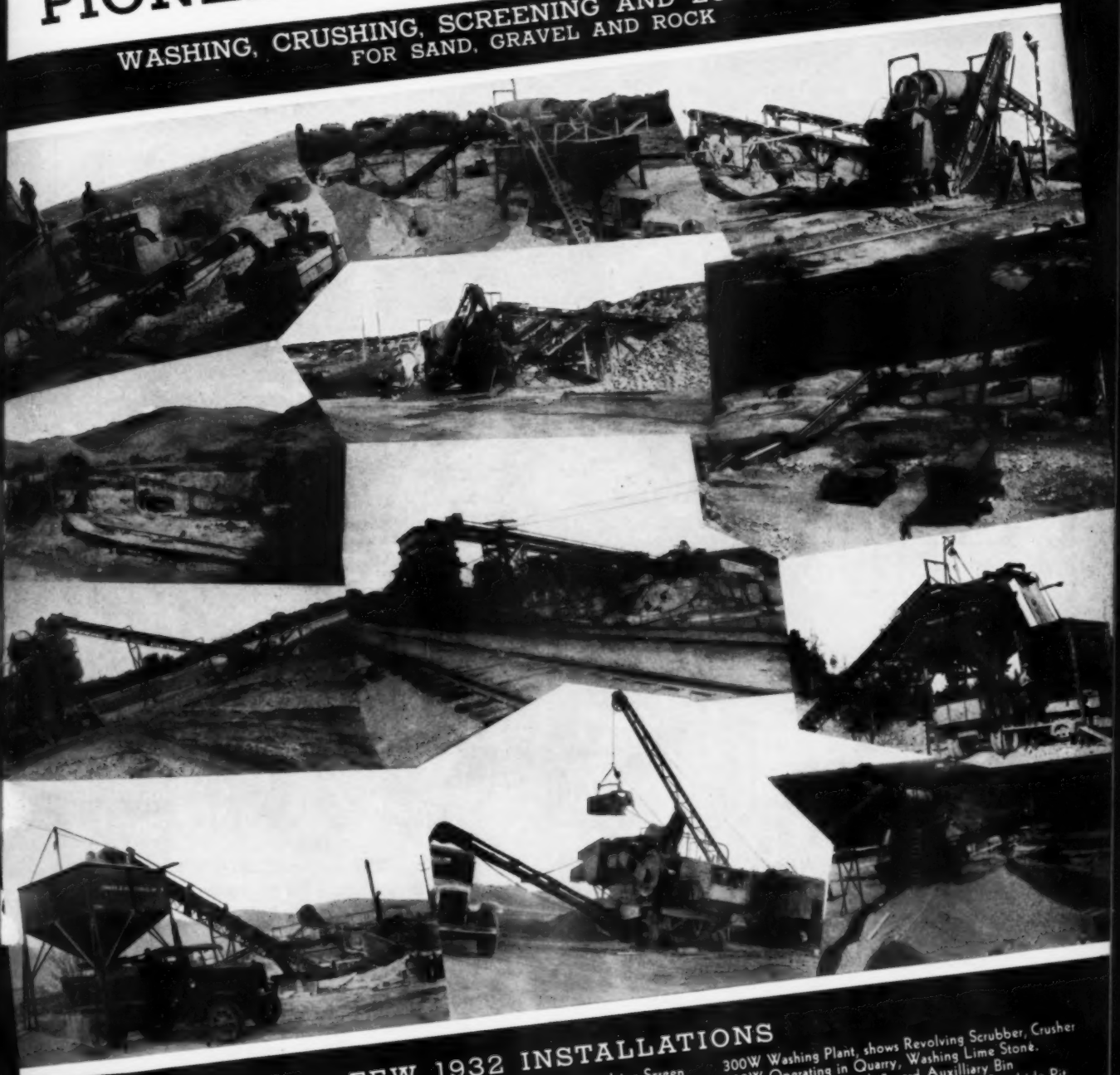
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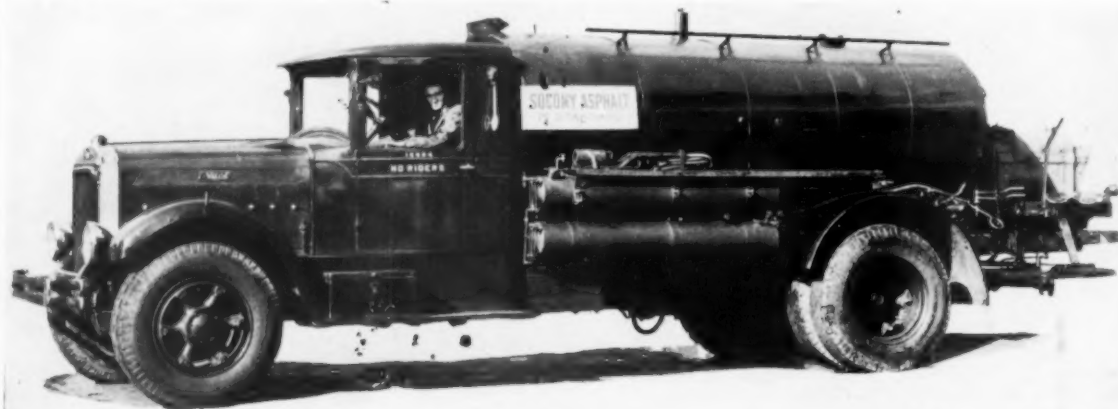
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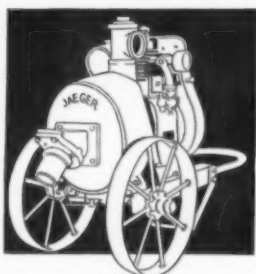


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1933

BRINGS A NEW



## ALLIS-CHALMERS TRACTOR MODEL "M"

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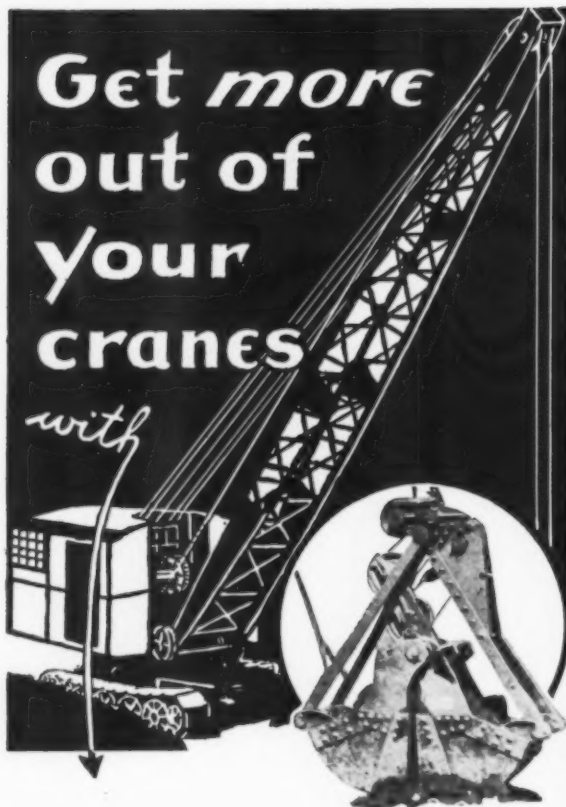
- Weighing only 6,200 pounds, the "M" delivers approximately 28 horsepower at the drawbar.
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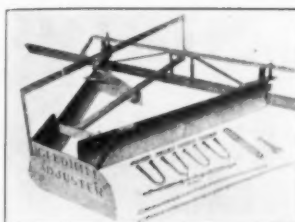
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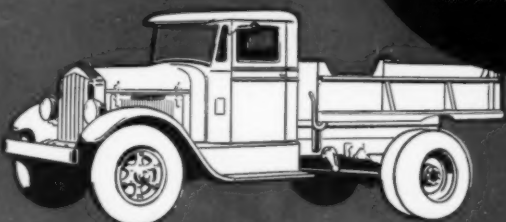
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*Main Office and Works*

WILLIAMSPORT, PA.

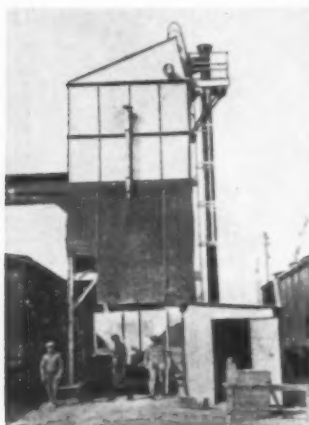
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# Construction in 1933—

## What Are Its Prospects?

**T**AKEN as a whole, 1932 was a disappointing year. The promise it held for an increase in work was shattered by the smallness of the contracts actually awarded. Engineering construction was to have been the main industry on which the country could rely in meeting the depression. Business was to have been primed and unemployment relieved by undertaking a huge new building program. The Reconstruction Finance Corp. was allotted \$1,500,000,000 to be loaned for self-liquidating projects. The states and the cities were expected to join in and swell this large total. But the result was far different.

Estimated figures for contracts awarded show that there was a decline of approximately 25 per cent from the level of 1931. When the final total has eventually been obtained and entered on the record it will probably be found that instead of 1932 being a banner construction year, it was the poorest since 1922. All things considered, this is not a severe decline; other industries have suffered far more. And other industries have far less basis for an optimistic outlook for 1933. Construction remains the sole big industry capable of lifting us from the depression and the prospect for financing, both private and governmental, is much better for the coming twelve months than it was for those that have just passed.

One of the reasons for disappointment was the delay in the self-liquidating project scheme. The American Society of Civil Engineers estimated that there was some \$1,400,000,000 of such work awaiting financing but by the end of the year the R. F. C. had authorized loans of less than 15 per cent of this total. Further, of the loans authorized all but a very few were held up either by law suits or the necessity of obtaining additional local legislation. As a result contracts were let on only one or two of the smaller projects and the awards had very little influence on the 1932 figures. Many of the difficulties will be cleared away during the coming year and in addition it is expected that a large number of new loans will be authorized. Thus, contracts from this source should continue in large volume throughout 1933.

*Much R. F. C. Work*

*Near*

*Contract Letting*

*Stage*

*By*

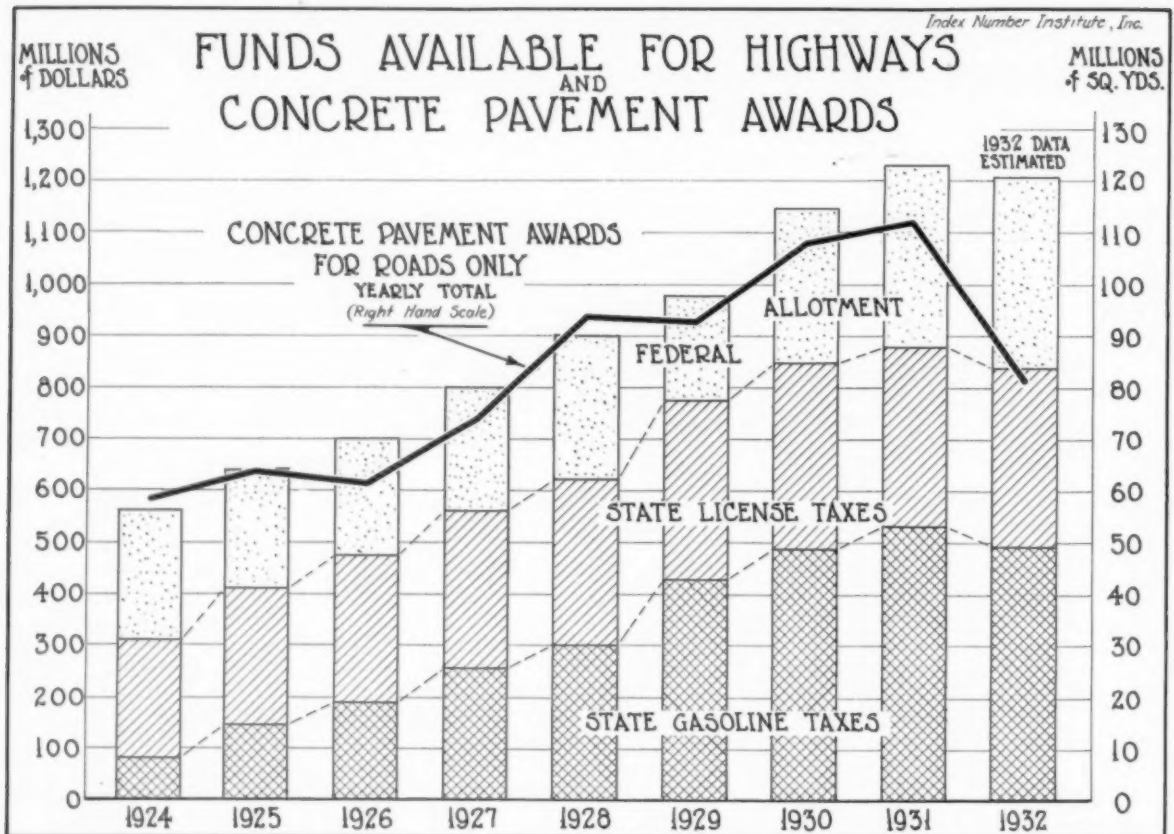
*John A. Moffitt*

*Index Number Institute*

### HIGHWAYS

Highway construction, although not considered a self-liquidating project by the government, was given an additional \$120,000,000 under the Federal Emergency Relief and Construction Act. This sum, which was quickly drawn upon by the states, when added to the regular Federal Aid, made a total that was larger than that of 1931. The income received from state gasoline taxes held up fairly well in the first half of the year, but fell rapidly thereafter. The estimate shown on the chart, which necessarily was based upon early data, may therefore be too high. State license taxes were only slightly below 1931 and the sum of these made the total funds available for highways not much less than the preceding year.

The amount of contracts let for highway construction, however, has been very considerably less. The reason for this is that the states, in many instances, have endeavored to use the funds more for relief than for construction. Therefore, a larger percentage of the money has gone toward maintenance than heretofore since more men could be employed in that work. Also, there



has been a steady diversion of funds, particularly gas taxes, for relief and other purposes so that the actual amount available for construction was considerably less than the theoretical total. The result of these influences is found in the sharp decrease in volume of concrete pavement awards which declined from a high point of 111,852,000 square yards in 1931 to an estimated figure of 81,543,000 in 1932.

So far as can be seen the total of road building is more likely to decrease than increase during 1933. Early reports indicate much lower license fees for next year and gasoline taxes will probably continue to move downward. Federal appropriations point to a smaller rather than a greater amount of Federal Aid although many believe there will be another emergency grant. There is also the possibility that the need for relief funds during the coming year may cause additional states to dip into the amounts that should be allocated to highways. It would seem that some of our surplus labor could be put to excellent use in building the many new roads required by present traffic conditions, as well as for maintenance work, but it must be admitted that the picture appears much brighter in other fields of construction engineering.

#### BRIDGES

The outlook for bridge building, for example, seems excellent, despite the fact that the total contracts in 1932 were some 40 per cent below those in 1931. The low level of bridge building may be judged by the fact

that almost a third of the contracts awarded last year came through the lettings of some \$23,289,000 by the Golden Gate Bridge in San Francisco in November. Several other bridge projects are now very near the contract-letting stage and the amounts involved are quite large.

The biggest single job now in view is the San Francisco Bay bridge which is to be erected by the California Toll Bridge Authority. Financing has been approved by the Reconstruction Finance Corp. and some work awarded. Additional state legislation with respect to approaches is required before the way is cleared for the complete job and enactment is expected when the legislature meets next Spring. The New York State Bridge Authority's plan for a bridge over the Hudson at Catskill has been authorized a loan by the R. F. C., conditional upon the enactment by the State Legislature of an amendment to the statute authorizing construction. Little difficulty is anticipated in obtaining this change soon after the first of the year. The New Orleans Public Belt Line Bridge is being delayed by difficulties in getting leasing contracts signed, but Reconstruction funds will be available as soon as this problem is ironed out. The Tampa-Clearwater Bridge will also be under construction soon after January first.

The attitude taken by the McKee Administration in the City of New York halted plans to recommence construction on the Triborough Bridge connecting Queens, Manhattan and the Bronx. Whether this attitude will be changed under the O'Brien administration after Jan-



uary 1 is not yet known. R. F. C. financing undoubtedly could be obtained and work on this bridge would certainly aid New York's relief problem. There are a number of other bridge projects, some of them only slightly smaller than those enumerated above, on which contracts may be awarded during the coming twelve months and it seems certain that the total will be well above 1932 and, possibly, even above 1931.

#### SEWERS

Contracts awarded for the construction of sewers has been steadily decreasing for a number of years. Figures for 1932 indicate that just slightly over a third as much work was let in that year as in 1931 and less than a quarter as much as in 1927. But there is a good prospect that this down trend will be turned upward in 1933. The R. F. C. has recognized that sewers are a self-liquidating project and many cities find that they have a definite need for additional service. Minneapolis, Atlanta and Cleveland have planned some of the largest plants with costs running \$15,000,000, \$14,000,000 and \$11,000,000, respectively, and a number of other cities have additional projects that would add considerably to the total.

There is also a growing demand for sewage disposal plants and there are good possibilities for a large amount of this type of construction during the coming year. The sewage disposal system for Chicago, yet to be completed, has an estimated cost of \$50,000,000, while in New York it will run at least \$30,000,000. Cer-

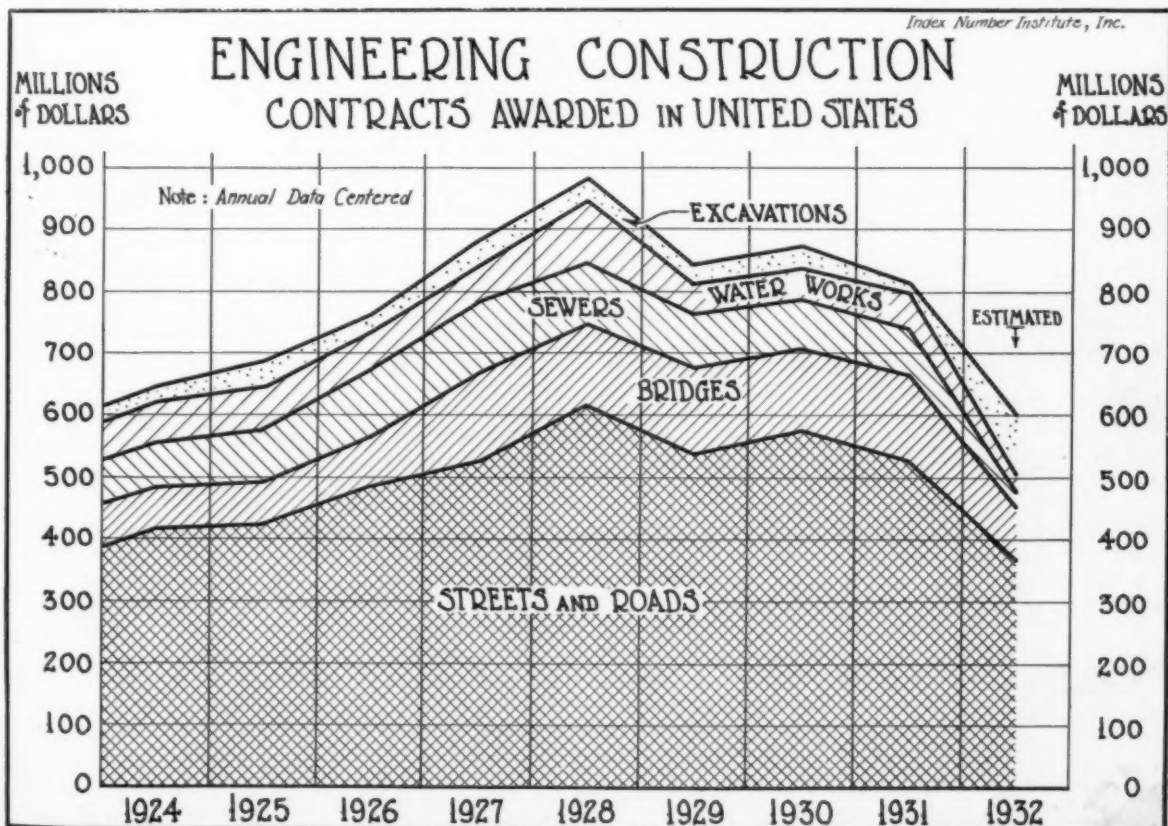
tain of the smaller cities that heretofore have been allowing their sewage to flow into lakes and rivers will find it necessary to erect disposal works in the near future in order to abide by newly-enacted anti-pollution laws.

Somewhat similar are the garbage disposal plants now being erected or planned by several municipalities. Perhaps the largest system and the one that is receiving the most immediate attention is that in New York City where the cost has been estimated at \$12,600,000. Altogether there is enough work in this field to bring the figures for next year well above 1932, even if only a small proportion of the total were actually awarded.

#### WATERWORKS

The Reconstruction Finance Corp. has found that water works offer one of the best sources for loans for self-liquidating projects. The first R. F. C. loan was made to the Metropolitan Water District of Southern California which will bring Colorado River water to Los Angeles and fourteen adjacent cities. Work was held up for a time by a taxpayer injunction suit, but this has recently been dismissed and contract awards are expected in the near future. Wilmette, Ill., has already let its contracts, the Seattle, Wash., water supply system awards are expected soon after January 1 and there are a number of other smaller projects that are almost ready for bids.

In addition, loans have been authorized for several projects where contracts have been held up by law suits.



Even in these cases little appreciable delay is anticipated. Nor has the R. F. C. already made loans on all the projects which might qualify. There are, for example, the Delaware River Supply System of New York City with an estimated cost of \$59,000,000 and the Brooklyn water tunnel and the New York water main enlargement plans which combined would cost nearly \$100,000,000. Cleveland, Akron, Rochester and many other cities are also seeking improved facilities. Thus, although water works contracts in 1932 were but half of the 1931 total, a new high record may be expected during 1933. The loans so far authorized would seem to assure that.

#### EXCAVATION AND EARTHWORKS

Contracts for excavation work showed a marked increase in mid-year which brought the total lettings for 1932 to a higher figure than those of 1931 or of any recent year. This was mainly the result of the government placing its contract work for levee and flood control along the Mississippi River. There was also some increase in the volume done around the Great Lakes, but the total in that area remained below normal. It would appear that 1933 will be a prosperous year for the companies engaged in this type of construction, as many of them, particularly those working on the Mississippi River, have already obtained contracts that will keep them busy throughout the coming twelve months.

The Middle Rio Grande Conservancy District, which received a loan from the R. F. C., placed some of its contracts and commenced work just before the end of the year and it is quite likely that several other similar projects will receive Reconstruction financing. An application has been made for the \$15,000,000 irrigation project on the Verde River, north of Phoenix, Ariz., and Los Angeles County is understood to be moving ahead with San Gabriel Canyon job. Other probable contracts are the Yakima River development and the Lake Okeechobee flood control. Advance planning by the Department of the Interior also indicates that there will be increased funds available for reclamation projects.

The outlook for tunnel construction is promising, despite the fact that the attitude now taken by the city of New York will apparently postpone for some time the construction of the mid-town tunnel by the Port Authority. This is perhaps the biggest individual tunnel job on which engineering has been completed, but there are a number of others which may be moved forward during the coming year if loans are provided by the R. F. C. Important among these is the Norfolk-Portsmouth Vehicular Tunnel and the Philadelphia subway. There is also a possibility that the Staten Island subway, a \$40,000,000 project running under the Narrows and through Brooklyn, may be financed during the coming year.

#### RECONSTRUCTION APPLICATIONS

As it seems probable that the Reconstruction projects will furnish a very large proportion of next year's construction, much will depend upon the kind and type of work that will be approved by the Corporation. The applications received and graded by the Engineers' Advisory Board give some indication of what may be expected. Class I applications are final and supported by

complete data. They represent a wide range of activity and include many small loans. Class II applications are incomplete and informal, while those in Class III are accompanied by little or no data. Applications in the second and third classes are moved up to the first class as soon as the needed information is furnished and engineers are constantly at work to make the data adequate for the Board to render its decision.

#### R. F. C. ENGINEERS' ADVISORY BOARD Loan Applications Received to November, 1932

	1st Class		2nd Class		3rd Class	
	No.	Amount	No.	Amount	No.	Amount
Water Supply....	30	\$ 3,309,120	16	\$ 20,484,000	39	\$ 36,439,257
Bridges.....	11	34,725,533	4	3,380,564	13	93,051,000
Irrigation.....	5	31,963,000	7	2,523,956	9	18,279,000
Power Plants....	5	6,859,000	5	32,670,000	4	980,000
Sewers.....	3	36,580,000			4	1,695,000
Terminals.....	2	350,000			2	1,000,000
Docks.....	2	675,000	1	75,000		
Housing.....	3	5,695,000	5	47,418,000	3	30,700,000
Markets.....	1	1,500,000			3	4,320,000
Airports.....	1	4,100,000	1	7,000,000		
Tunnel.....			1	75,000,000	2	38,440,000
Ship Canal.....					1	160,000,000
Miscellaneous....	1	40,000	2	500,000	3	218,000
	64	\$125,796,643	42	\$189,051,520	87	\$385,522,257

While all these applications will not be passed, there will undoubtedly be enough that can meet all the tests to assure the construction industry a good year for 1933.

### Wide Variety of Drilling Operations on Memorial Highway

THE World War Veterans' Memorial Highway near the town of Wilmington, N. Y., 11 miles from Lake Placid, is being rapidly pushed to completion. The road will have a minimum width of 30 feet and an average grade of 9 per cent. Its base is of solid granite from the mountainside and rock fill supported by retaining walls built of blocks of stone removed from the right of way in excavating. The final surface will be waterbound macadam. The drilling operations involve sinking, pop-holing, drifting, or "snake-holing", and some holes which are so elevated that they might be referred to as stoping. The Williamson-Howard Construction Co. of Youngstown, Ohio, contractor for this job, is using Cleveland H17 drills for sinking and pop-holing and a D9 drifter for flat and angular holes. The stope holes are drilled parallel to the natural lines of cleavage of the granite, loaded and shot in such a way as to lift the stone with comparatively little shattering so that the blocks may be used for construction of the retaining walls. It is expected that the road will be dedicated and open to the public in August, 1933.



A  
Stoping  
Operation  
on the  
World War  
Veterans'  
Memorial  
Highway

# Economies

on a

5-Mile

Top Soil

Road



*Nello L. Teer, Durham, N. C.*

*Completed Heavy Grading*

*and Top Soiling*

*Between Christmas*

*and the Fourth of July*

**H**OW many men do you use in dressing the slope of earth cuts? Even before the days when it was fashionable for a contractor to use a large number of local unemployed men for unskilled labor we have seen a dozen or so men with picks and shovels trimming or dressing slopes. Nello L. Teer does not find a labor organization of this size necessary but handles it all with the shovel, the pit men doing such hand work as is necessary. On the 5.02-mile "gravel" road job which this contractor built west of Richmond between December 21, 1931 and June 13, 1932 there were a number of cuts running up to 17 feet in depth and as much as 500 feet long with 1 to 1 slope. In a few cases these were laid back to 2 to 1 slopes for borrow where there were heavy fills adjacent. On every one of these cuts the shovel operator trimmed the slope very close to the required grade and the pit men, who also handled the oiling of the Lorain 75-B, did the small amount of hand trimming necessary to remove inequalities in the slope.

The cuts ran from 2 to 17 feet in depth and usually the cut and fill balanced within 1,200 feet but on one section the haul to the fill ran close to 2,000 feet with

no overhaul allowed. The 1931 specifications called for 1,000 feet of free haul plus overhaul but in 1932 all overhaul was eliminated. The new "gravel" top soil road was built to a width of 20 feet with 5-foot shoulders on fill and 6-foot shoulders on cut. On this was placed the top material classified as gravel to a loose depth of 14 inches and compacted to 10 inches. All of the fills were placed in 12-inch layers and rolled with a Euclid sheepsfoot roller pulled by a Caterpillar Thirty.

The contractor handled all of his clearing and grubbing on the gravel pit as well as the right-of-way, averaging about twelve men for this work. About 1,000 yards of rock cut was encountered on one point on the job, all of which was drilled with an Ingersoll-Rand 110-foot portable compressor and jack hammers with the drill holes running to a maximum of 10 feet. The rock was blasted with du Pont 40 per cent dynamite. In contrast to the rock section was one 4-foot muck hole which was excavated to 3 feet below grade and backfilled with the rock from the ledge. Fortunately it was within an economical hauling distance so that the ledge provided an "assist."

The excavation was handled by a fleet of three Biehl 12-yard wagons equipped with 15-ton Euclid crawler-type tracks. Another economy in organization was the use of only two winders who stayed at the dump instead of a winder and tractor operator for each unit.

## THE "GRAVEL" PIT

The "gravel" for topping this job was secured from pits near the right-of-way. The hauls from these pits ran from  $\frac{3}{4}$ -mile to  $1\frac{3}{4}$  miles. All gravel hauling was done by the City Transfer Co. of Durham, N. C.





*Loading the Gravel Trucks*

using five Corbett 2-ton trucks with Firestone dual pneumatic equipment. When the haul was longer these trucks were supplemented with a few local trucks. The trucks dumped the top material on the road in piles. It was spread with a Caterpillar Sixty and LaPlant-Choate bulldozer and trimmed with a Galion 14-foot grader pulled by the Sixty. Work progressed so rapidly on this project that it was possible for the contractor to assist in completing the fill on the next section of the project where the contractor had been delayed in completing the work.

#### PERSONNEL

Nello L. Teer, Durham, N. C. was the contractor for this 5.02-mile "gravel" road project with R. E. Scroggs as Superintendent. F. L. Ward was in charge of the gravel hauling for the City Transfer Co., Durham, N. C. For the Virginia Department of Highways C. W. Staggs was Resident Engineer.

## Power Shovels Eighty Years Ago

**R**ECENTLY a copy of the original drawing illustrated was discovered. It shows a "Land Excavator, Proprietor and Builder, J. C. Osgood—1852." J. C. Osgood, founder of The Osgood Co. now located in Marion, Ohio, would be astonished could he see the modern gasoline, electric, steam and diesel power excavators working today. The early design shown was for a "two-horsepower" railroad-type shovel. The power was taken through gears from the forward roller shaft on the treadmill of the two horses to the countershaft. Two pinions were loose mounted on the countershaft and engaged by sliding jaw clutches. The pinions engaged the gears on the drum shaft to furnish power for hoisting.

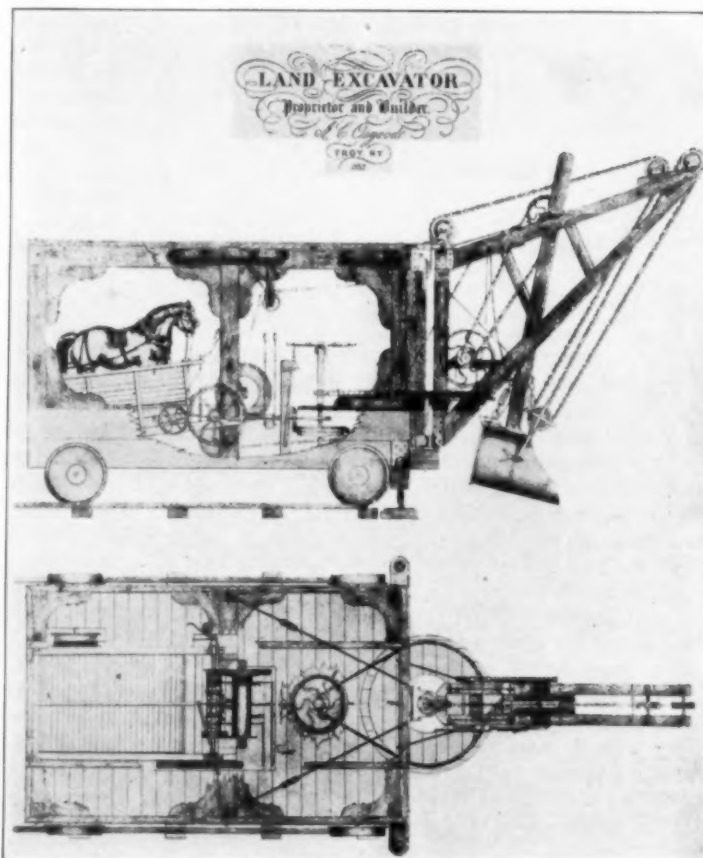
Two sliding bevel gears operated by hand levers were also mounted on the countershaft. These could be moved into mesh with a bevel gear on a longitudinal shaft to swing the boom in either direction. The longitudinal shaft had a bevel gear on the forward end which meshed with a bevel gear on the vertical

shaft. The chain operating from the chain sprocket on the vertical shaft moved the swinging circle in either direction depending upon which of the bevel gears on the countershaft had been engaged with the bevel gear on the longitudinal shaft. A hand wheel was mounted at the top of the vertical shaft so that the machine could be swung by hand when the bevel gears were not engaged.

A winch head was mounted on the left end of the countershaft and used to furnish travel power. A rope was anchored to the drum on the rear axle, wrapped around the drum several times and the free end wrapped around the winch head. Then, by having the horses operate the countershaft, the rope was unwrapped from the axle drum and wrapped on the winch head turning the drum and causing the machine to travel forward or backwards, depending upon the way the rope had been wrapped.

Crowding was just as important in 1852 as it is today but in those days they did not have the tremendous crowding power and precision control that is available on modern equipment. This eighty year old design shows a chain crowd operated by hand power through a hand wheel.

We take our modern ingenious power excavators very much for granted but if we look back eighty years to this real innovation in shovel design we will realize that much credit is due to the designer of this machine for the novelty he introduced, but very probably he was laughed at by the same type of honest citizen who was vastly amused by the first automobile and the first airplane. It is interesting to note that the "power" shovel really antedated the steam shovel which now is largely replaced by the modern gasoline and diesel "power" shovel.



*Reproduction of an Original Drawing of a 2-Horsepower Excavator of 1852*



# Winter Construction

## Part IV—Handling and Heating of Aggregate



THE first essential in handling aggregates for use in winter construction is the prevention of freezing, as frozen gravel or sand is exceedingly difficult to thaw. In ordering sand and gravel from a producer, contractors should stipulate that no wet sand or wet gravel shall be shipped in freezing

weather. Most producers today, however, store sand and gravel for winter construction under cover so that it drains sufficiently to prevent its freezing into a mass during shipment. Further, many railroads now refuse to accept a shipment of wet aggregate in freezing weather. Should one or more carloads be received in frozen condition, probe pipes with live steam is about the most effective way to thaw it for they will quickly work a hole into the mass and then heat up the aggregate, its handling during the winter is practically the provided a steaming house which was just large enough to admit two gondola or hopper-bottom cars and which could be closed tight. The live steam was admitted for several hours with success in thawing out the aggregate.

Aside from means to prevent freezing of the aggregate, its handling during the winter is practically the same as under normal weather conditions. Cranes, belt unloaders and conveyors, and trucking to stockpiles are used. A study of reports which have been received from a large number of contractors shows that apparently more aggregate is handled by wheelbarrows on winter work than is customary during the summer. This is probably due to the fact that the volume of concrete being placed does not warrant the installation of costly machinery.

### HEATING OF AGGREGATES

Usually the simple addition of hot water to the mix is not sufficient to produce a concrete which will retain a sufficiently high temperature in the forms to insure it against freezing. Most jobs provide means for heating

*A Symposium Covering Expense,*

*Excavation and Grading,*

*Steel Construction,*

*Handling and Heating of*

*Aggregate*

*and Protection of*

*Concrete*

aggregate in the stockpile or bin. Among the more prominent methods mentioned in the reports which we have received are the use of a coil of steam pipe inside the batching bins, grillages of pipe at the bottom of stockpiles, pipe probes worked into the stockpiles to apply live steam and the use of heavy tarpaulins over the top of the stockpiles to retain heat applied by these or other methods. Probably the most general method of heating aggregate is piling it over a section of corrugated culvert pipe and maintaining a fire within the pipe. A vertical smoke stack or chimney may be placed in the end of the pipe, but usually some sort of a sheet metal baffle at the end serves to regulate the draft for the fire. Old smoke stacks have many times served as heaters instead of culvert pipes. Many contractors use an oil burner in the mixer which either heats the aggregate there or maintains the high temperature of the aggregates which have been previously heated in some other manner. One New York State contractor working on a Normal School building used a truck to haul all aggregates to a large heated storage shed where they were kept for at least 24 hours before using.

### HEATING THE MIXING WATER

Even though aggregate may not be heated in cold weather prior to its entering into the mixer, it is invariably the case that the mixing water is brought to a high temperature, usually close to the boiling point. This is accomplished either by heating the water with steam direct from a boiler or drawing from a tank in which the water is kept at a high temperature by an open steam jet. The use of Aeroil and Hauck oil

torches is mentioned quite frequently in the reports which have been received, as a means of maintaining the high temperature of aggregate and mixing water during the time they are revolving in the mixer. Mention is also made of canvas flaps over the opening to the mixers to prevent cold winds blowing through and chilling the mix.

#### ACCELERATORS

The recommendations of various committees and the Portland Cement Association that reliance be placed on heating aggregate and mixing water and proper protection of the concrete during winter construction rather than on accelerators seems to be generally accepted. In about one-tenth of the reports received mention is made of the use of calcium chloride as an accelerator and in one instance an additional amount of cement was used.

#### PROTECTION OF CONCRETE AFTER POURING

For periods of two to five days after concrete is poured at temperatures below 40 degrees, the mass must be kept in a humid atmosphere at a temperature of approximately 60 degrees to insure proper curing and the full designed strength. In placing, the concrete is exposed to low temperatures for the shortest space of time possible between its delivery from the mixer to a buggy, wheelbarrow or chute. After placing, the concrete is usually protected with a canvas housing, and heat from coke or oil burning salamanders, and in many instances steam, in piping is carried around the structure and the top of the concrete is protected with straw. The steam pipes are either perforated or the joints are not made up tight, thus permitting a considerable volume of steam to escape into the space between the canvas or tarpaulin housing and the forms.

An Illinois contractor reports the use of Sisalkraft paper instead of tarpaulins for the enclosure. He used salamanders beneath any slabs. A Kentucky contractor reporting on a wall bearing building with concrete floor slabs states that the slab was protected by enclosing the lower story and using salamanders beneath the slab as poured. Straw and tarpaulins were placed on top of the slab. Temperature readings were taken every hour

and a minimum reading of 60 degrees Fahrenheit maintained for four days after the pouring. The forms were stripped in 21 days. A Michigan contractor reports the use of tarpaulins on top of the slab supported about 6 inches above the slab so as to leave an air space through which the heated air could circulate. Salamanders were placed below the slabs to furnish heat. One Missouri contractor working in both Missouri and Oklahoma protects the concrete by covering with paper and uses a number of lanterns below the slab to furnish heat.

*(To be continued in the February issue)*

### A Study of the Embrittlement of Hot-Galvanized Structural Steel

**T**HIS study of the embrittlement of hot-galvanized structural steel came about in response to a request to the American Society of Testing Materials for material on this subject which is of concern to transmission tower engineers and consumers and producers of hot-galvanized steel products. Battelle Memorial Institute was engaged to carry on this research under the general direction of a special subcommittee of A. S. T. M. Committee A-5 on Corrosion of Iron and Steel. The present publication issued by the A. S. T. M. comprises the official report of the investigation by Battelle in the form of a technical paper of 83 pages by Samuel Epstein, and the 1932 report of the subcommittee in charge, including a recommended practice for safeguarding against embrittlement of hot-galvanized structural steel products and procedure for detecting embrittlement.

Copies of this publication, bound in heavy paper cover, comprising 109 pages and illustrated, may be secured from the American Society for Testing Materials, 1315 Spruce St., Philadelphia, Penna., at a price of \$1.00 per copy.

#### Decrease in Blasting Cap Accidents

**T**HE Institute of Makers of Explosives reports that during the first six months of 1932 there was a decrease of 53 1/3 per cent in blasting cap accidents to children as compared with the number reported during the same period of 1931. In the hopes of still further reducing the accidents, the Institute has enlisted the support of superintendents of public instruction in various states; Boy Scouts and Girl Scouts, the Department of Agriculture, the Bureau of Mines and the safety organizations of various states. A special plea is made to all users of explosives to see that blasting caps are kept out of the reach of children.



*A Steel Viaduct in Eastern New York, the Major Portion of Which Was Built During the Winter*

# Motor Trucks Haul Material

*for*

## Rock Fill Dam



*Dumping a Large Boulder*

ON the San Gabriel Dam project located in the San Gabriel canyon some 30 miles from the city of Los Angeles, motor trucks are playing a very interesting part in handling the 1,200,000 cubic feet of metamorphic rock. This dam is one of two being constructed by the Los Angeles County Flood Control District and is of unique construction because it is being built entirely of rock fill with a concrete slab facing. The rock fill consists of all sizes of rock from quarry chips to single pieces weighing over 25 tons and all of it is being hauled by motor trucks.

The quarry is located 2 miles upstream from the dam site and, owing to the narrow canyon, it was necessary to build a new road in the side of the canyon between the quarry and the dam site. The road in itself holds the key to successful operation on this kind of work. It was built 30 feet wide and surfaced with waste from the quarry. It is sprinkled with water continuously to bind the road bed, and the trucks operating over it have given it a remarkable smoothness. At the dam site ramps have been provided with a short grade to reach each 25-foot lift as the fill progresses.

### QUARRY OPERATIONS

A great many estimates were made prior to the beginning of the project as to what the bulking would be in the fill over the bank measure of the rock. Thus far, the swell has been 40 to 60 per cent, making a truck yard almost equivalent to a fill yard in place. The haul is two miles and the trucks average 25 minutes per round trip. The dumping time on the fill varies from one to three minutes, depending upon the amount of maneuvering necessary to place the load.

The specifications call for a minimum of 2,000 yards of fill a day. Rock is loaded in the quarry by two Bucyrus-Erie power shovels, one a 52-B and the other a 120-B. As compared to most construction jobs, this project possesses a much more difficult problem because the rock is blasted to allow as many large pieces as pos-

### *An Outline of the Operation of Motor Truck Transportation on the San Gabriel Dam of the Los Angeles County Flood Control District*

sible. Naturally, the larger the rock the greater the danger of damaging the truck and shovel equipment. When rocks weighing 20 tons or more are loaded, smaller pieces are loaded first to form a cushion for the larger ones. The truck loads average 60,000 pounds gross.

### THE ROADWAY ON THE FILL

Owing to the fact that most of the rock being hauled is in 1-cubic foot pieces and larger, it was a serious problem to create a roadway on the fill smooth enough to eliminate cutting and excess wear on the truck tires. At first, large rope mats, made up of 3-inch hawser rope, were placed at the dumping point, onto which the trucks backed. This method was discarded, however, as impractical and a roadway was smoothed off on the fill by hand labor.

The McCutchen Transportation Co. of Los Angeles





*The Diesel-Powered Shovel Loading a Truck*

is the contractor for the hauling and is using ten specially built Sterling trucks with chain drive and powered with Waukesha 6-cylinder engines. The rear axle, instead of being of the conventional I-design, is made of 6-inch heat-treated steel shafting. The frames are 9-inch double-channels, wood-lined with solid oak planks and all cross members and other units are bolted to the wood inlay with no metal-to-metal contact. The front tires are 24 x 10/50 pneumatics, while the rear tires are 40 x 14 solid duals.

The stripped chassis weighs 15,500 pounds and the body and hoists are Wood Hydraulic Hoist & Body Co. products. The body is built of heavy steel plate, fabricated with H beams and the floors are laminated with 1/2-inch plate at the bottom and a 2-inch wood filler. The engine, headlights and cab are covered with heavy armour plate as a protection against heavy stones should any fall in the hauling operations.

## The 1933 Highway and Building Congress and Road Show

**G**AINING broader scope and a new significance because they will be staged coincidental with the meetings of virtually every national organization identified with highway and construction enterprise, the thirtieth Annual Meeting and Road Show of the American Road Builders Association, to be held in Detroit, January 16-20, although unchanged in its essential character, will come to a climax in a two days general program designated as the Highway and Building Congress.

The decision of the thirty-four participating and sponsoring organizations of the Congress to hold coincidental meetings followed by two days of general sessions recognizes the necessity for common action against present conditions in the highway and construction industry. Enlarged attendance at the individual organization meetings and the development of a common program looking toward economic recovery are expected to be the outstanding benefits of the Congress.

Retaining its individual character during the first three days of the Congress week, the annual convention of the A. R. B. A. will devote its energies to a number of subjects of immediate and vital importance to the highway industry. Outstanding among these are the questions of conserving motor vehicle and gasoline tax revenues to the purpose of highway construction and maintenance and the wisdom of a continued highway program to relieve unemployment. These subjects are also scheduled for prominent places on the Highway and Building

Congress program, the first day of which will be devoted entirely to highways. In connection with the Congress, there will be an exhibit at the Detroit Municipal Airport of equipment and materials used in highway construction and maintenance as well as a display of motor trucks.

Indicating the scope and variety of highway matters to be dealt with in the A. R. B. A. convention sessions is the fact that twenty-three committee reports will be made. Thirteen will be of a general nature, the remaining ten divided equally between the sessions of the City Officials' and the County Officials' Divisions. Three reports are scheduled for the first general session, covering different varieties of paving types, asphalt, brick and reinforced concrete. Another report to be made at this group session is that of the Regional Surveys and Plans Committee. Two subjects will be presented by the Public Relations Committee, "The Importance of Technical Direction of County Highway Operations" and "County Road Work and Its Relation to Unemployment". The second day of the Congress will be devoted to reports of two committees, Finance and Traffic. At a concurrent meeting, three general committee papers will be submitted, dealing with single track concrete roads, graded aggregate low cost roads, and the use of emulsions. In the afternoon, papers will be presented on the design, construction and maintenance of city streets. The sessions of Wednesday will be devoted to the activities of the Association, the subjects scheduled covering concrete pipe, corrugated metal pipe, and equipment for low cost roads. The concluding group of four reports presented that afternoon will deal with equipment for spreading and finishing, truck scrapers, snow plows, and hauling equipment.

Thursday will be Highway Day, at the sessions of which the following papers will be presented: "Highway Program of the Nation: Its Present Status and the Outlook for the Future"; "Importance of Highway Transportation to Economic Recovery"; "Correlation of Different Forms of Transportation"; "What Highways Mean to the Economic, Educational and Social Life of the United States"; "Highways Are Self-Liquidating Projects"; "Diversion of Motor Vehicle and Gasoline Tax" and "The Interest of the Agricultural Industry in Adequate Highways". Friday will be Construction Day and the organizations primarily identified with road building will lend their full support to this program just as those whose functions relate most definitely to general construction will share in the activities of Highway Day. The program for Construction Day is being arranged by the Construction League of the United States.

## Removal of the World's Largest Cofferdam

**T**HE removal of the world's largest cofferdam is under way at West St. John, New Brunswick. The dove-tailed sheet piling, in some places sunk to a depth of 90 feet, was erected in connection with the \$10,000,000 new port development undertaken in 1928 by the Harbour Commissioners of St. John.

More than 125 men are reported to be working day and night shifts with locomotives, draglines and other equipment in the removal of the huge dam which held back the Bay of Fundy during excavation. The work is expected to require five to six months. During the operations, about 500,000 yards of stone and clay will be removed by dredging as well as some 200,000 yards by the draglines. The steel piling to be removed weighs 4,000,000 pounds. The cofferdam has a perimeter of 5,890 feet, while the area enclosed to permit dry excavation and concrete construction was 43 acres. The Atlas Construction Co. is the contractor for the work.

This project included the extension of the harbor and the erection of a new 700-foot concrete pier, as well as a 1,500,000-bushel concrete grain elevator and two grain car dumpers. There is a large area of fill for the extensive railway tracks which are to serve the harbor area.



# Change of Methods

in

# Loop Levee Enlargement

**A**N interesting example of the need for different types of equipment to handle dirt under different conditions in levee construction and enlargement was found in the Sternberg Co., Inc., work at Lake Providence, La. A levee had been built in 1917 but the subsequent floods had shown the need for enlarging it. Consequently the 1927 grade line was established and most of the work on the river this past season was the enlargement of old levees to build them up to the new grade line. The work of this contractor at Lake Providence was started in August, 1931, and tractors and crawler wagons. It was first necessary to build a roadway or ramp across the old borrow pits to permit the tractors and wagons to cross them. This alone required the handling of 2,000 yards of non-pay dirt and even with this roadway in, the haul for the wagons was 2,700 feet. This was rather long and did not prove satisfactory so that when the 1932 season opened with the water receding, the contractor replaced the tractors and wagons on a  $\frac{3}{4}$ -mile haul with an industrial railway.

Borrow for the enlargement could not be taken from the old pits because of unsatisfactory material so an

*Because of*

*Haul and Ground*

*Conditions*

old levee was used with a P & H 775 dragline powered with a 120-horsepower Fairbanks-Morse diesel handling the dirt with a 45-foot boom and a  $1\frac{1}{2}$ -yard Page bucket. The old levee was cut in three lifts, the first a 12-foot cut, the second to the bottom of the levee and the third a section below the base of the levee as a borrow pit. This method gave the contractor about 5,000 yards per station, the amount of dirt needed for the same length of enlargement.



*Loading Abandoned Levee with a  $1\frac{1}{2}$ -Yard Dragline*

## HAULING EQUIPMENT

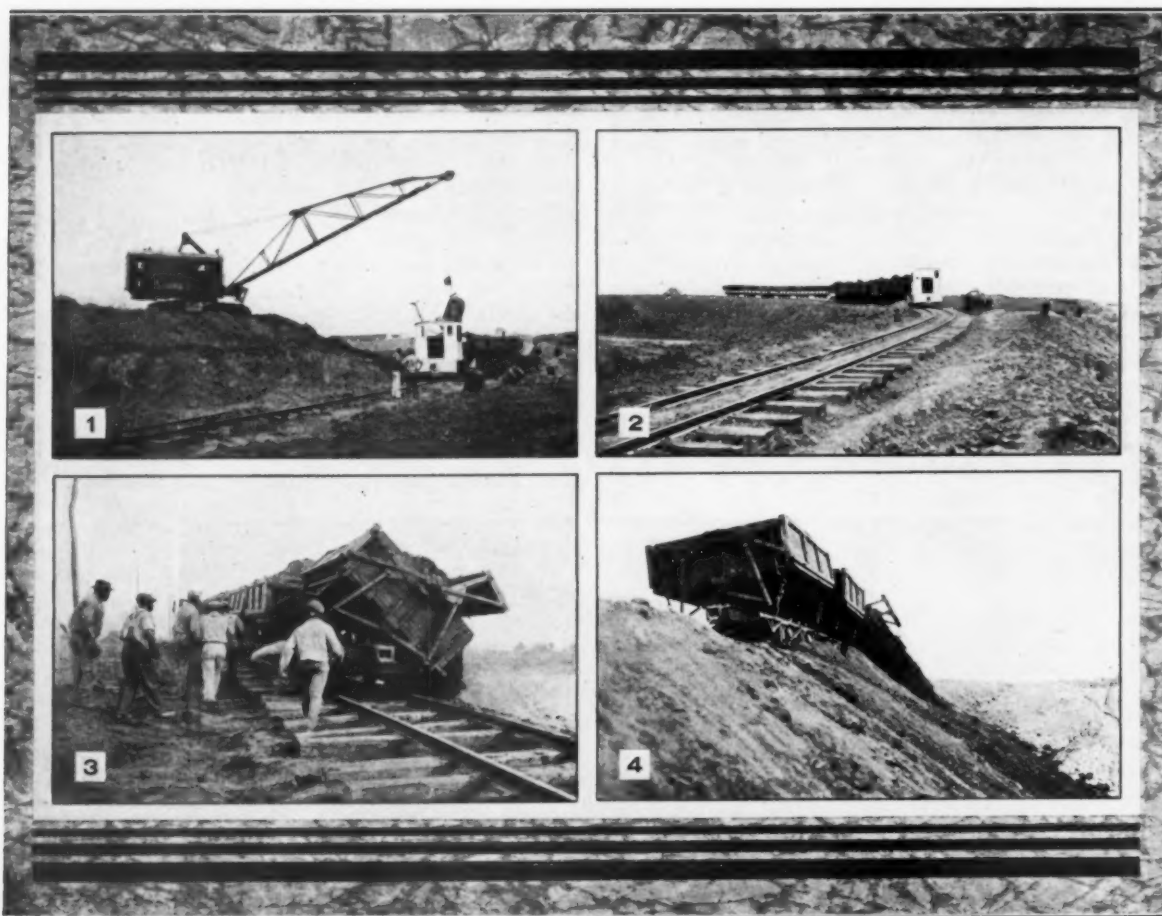
A 36-inch gage 70-pound track in 10-foot lengths was first laid on top of the levee to be enlarged and the dirt dumped to the side where the enlarged section was to be. As the work progressed a bulldozer was installed and it was unnecessary to move the track. Also the bulldozer cut a trench to undermine the loads as dumped so that they fell away from the cars and permitted them to dump clean. Any dirt left along the edge of the track was cleared away by the bulldozer between trains. Before the bulldozer arrived on the job the cars could not be dumped as quickly and it was necessary to move the track continuously toward the edge of the dump. This required the dump men to handle track all the time. It happened that one of the two industrial trains was laid up for repairs to the locomotive for some time so that the dump crew had time for the track shifting. When the two 8-car trains were running there was little time to waste between trains even with the long  $\frac{3}{4}$ -mile haul.

The dragline worked three 8-hour shifts with an operator and an oiler for each shift. The trains ran on two 11-hour shifts with the following crew for each

shift: one man to clear the track at the dragline and spot the cars; two locomotive engineers; two switchmen; two track men; six men on the dump; a mechanic and a helper; an operator for the Caterpillar Sixty with the LaPlant-Choate bulldozer, and the Superintendent. The Superintendent did not work on the night shift but lived within hailing distance of the work and was called if anything went wrong. As very good evidence that the work was carried on with proper diligence in his absence, the maximum haul in one shift of 11 hours was during a night shift when 33 trains were loaded, hauled to the dump and placed.

The locomotive equipment consisted of two 13-ton Vulcan gasoline locomotives with a 20-ton Whitcomb as a booster on the heavy grade from the dragline to the main track on top of the levee being enlarged. The trains were made up of eight cars of Western side-dump cars. There were nineteen of these cars on the job. With the two trains of eight cars moving as quickly as possible the outfit handled 3,000 yards of dirt in the two 11-hour shifts. The dragline loaded one car per minute with two and a half bucketfuls. In dumping the train the 6-man crew divided so that two men tripped and

(Continued on page 31)



MOVING DIRT WITH A DRAGLINE AND INDUSTRIAL RAILWAY ON THE STERNBERG CO. JOB AT LAKE PROVIDENCE, LA.

1. The dragline on top of an old levee loaded the dump cars with a  $1\frac{1}{2}$ -yard bucket. 2. The long up-grade with a curve tested the power of the locomotives. 3. The six-man crew on the dump tripped, dumped, pulled back and latched the eight cars in one and a half minutes. 4. Dumping the third car of the train on the river side of the levee.

# Speeding Up a Bay State Road Job



**P**RACTICALLY every road contract holds some feature of special interest. It may be that a superintendent is a genius for mechanical details which make the work easier, he may have a special grouping of his labor organization that clicks particularly well, or the equipment may be novel or exceptionally well-maintained. In Massachusetts last year on a 28,822 linear foot paving contract, 40 feet wide, on the main Boston-Providence road, it was a new paver that produced an average of 2,600 feet of pavement per 10-hour day.

Principal items of the project were:

Earth excavation.....	170,000 cubic yards
Ledge excavation.....	15,000 cubic yards
Ordinary borrow.....	36,000 cubic yards
Gravel borrow.....	77,000 cubic yards
Concrete paving.....	28,470 cubic yards
Reinforcing.....	1,242,600 pounds
Cable guard rail.....	14,000 linear feet
Trench excavation.....	13,000 cubic yards
Culvert pipe.....	23,000 linear feet

All of the work on this job was handled expeditiously but the chief interest is the operation of the new dual-drum paver. Carlo Bianchi himself stated, "Our experience with the double-drum concrete paver which we used on our section of the new Boston-Providence road running through Norwood, Sharon and Walpole, Mass., has been sufficient to convince us that it represents a definite improvement in paving machinery. It has satisfactorily set the requirements we had in mind when it was designed. The immediate operating organization around the paver consisted of one paving operator, one man dumping trucks at the skip, who also greased the equipment, five men puddling and spading, one finishing machine operator and three finishers. We found that but one Ord Type B double-screed finishing

*Carlo Bianchi & Co., Inc.,*

*Increased Production*

*235.6 Cubic Yards Per Day*

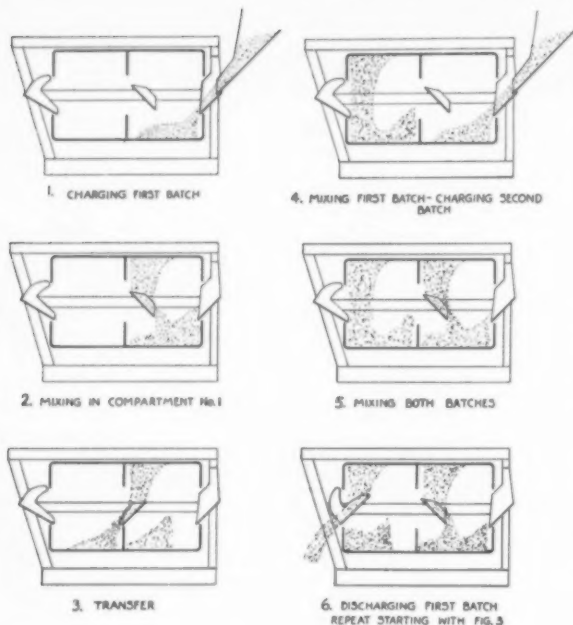
*with a Double-Drum Paver*

machine purchased in 1932 was required. With this equipment there was no trouble in maintaining a pace consistent with the progress of the paver."

Carlo Bianchi & Co. ordinarily uses the following organization for its regular 27-E Ransome paver: one paver operator, one man dumping trucks at the skip and greasing the equipment, three men puddling and spading, one finishing machine operator and two finishers.

With the dual-type equipment the average high-run for a 10-hour working day was 2,754 linear feet of pavement, poured 10 feet wide and 8 inches deep. This is equivalent to 680 cubic yards of concrete. The average daily run for the entire job was 2,600 feet. This output represents a considerable increase over the average which Bianchi obtained with the use of his standard 27-E paver when he averaged 1,800 linear feet of pavement, 10 feet wide by 8 inches deep, per 10-hour working day or the equivalent of 444.4 cubic yards of concrete.

The advantages of the dual-type paver are quite clearly indicated by the above figures. The net increase of three men in the immediate operating group is insignificant when considered in relation to the increase of 235.6 cubic yards or 50 per cent in the daily output of finished concrete pavement.



*Movement of Batches Through the Double-Drum Paver*

#### OTHER ADDITIONAL LABOR REQUIRED

Of course certain rearrangements were necessary in connection with the regular supporting operations which have to be carried on in the ordinary course of paving. For instance, it was necessary to employ two additional men in form setting, but this had no adverse effect on the unit cost per linear feet of this operation. In addition, it was necessary to increase the number of trucks employed in delivering batches of aggregate to the skip, so as to guarantee a proper supply of these materials at the required intervals of time. In this connection, too, the fact that more trucks were employed did not affect the unit hauling cost. The most important factor in this connection in any event is the length of haul.

It was not found necessary to increase the capacity of the screening plant providing aggregate because the

double-drum paver was used, as the same screening plant set-up which was normally used was able to meet every demand made upon it. The condition of the bank from which the materials were withdrawn would, of course, have a very definite effect on this situation, but on this project the gravel supply was both adequate and of uniformly high quality.

#### OPERATION OF THE PAVER

The Ransome 27-E dual paver on this job was similar to a single batch paver except that the drum was long enough to allow the mixing of two batches at one time. The drum was divided into two compartments and worked automatically as far as discharging the batches was concerned. The first batch was loaded from the skip to the first compartment and partially mixed, then as the second batch was hoisted in the skip, the first batch was transferred to the second compartment and the mixing completed. When the third batch was hoisted in the skip, the first batch was deposited from the second compartment to the bucket, the second batch was transferred from the first compartment to the second and the third batch was delivered from the skip to the first compartment. Thus two batches were mixed at the same time. With a  $1\frac{1}{4}$ -minute mix, this completed a batch approximately every  $47\frac{1}{2}$  seconds.

The mechanics of the operation is very simple. With a batch in each drum, as soon as the batch meter bell rings, the operator throws the hand lever controlling the power discharge of the outer chute which throws this chute into the discharge position. As soon as the batch is discharged, the operator steps on a foot pedal, which causes the outer discharge chute to be thrown out of the drum, and the transfer chute to be thrown into transfer position. By means of a delayed timing device, the operation of the pedal engages the power loader clutch which starts the power loader skip upwards. As the skip goes up, it opens the water valve which admits water to the drum and closes the valve from the auxiliary tank to the measuring tank. Just before it reaches the top, it causes the transfer chute to be thrown into mixing position and as it reaches the top, it knocks out

(Continued on page 37)



*Action Around the Paver on the Carlo Bianchi & Co. Job*



# Drilling and Blasting

## in Highway Grading

### Part V

Reported by  
Andrew P. Anderson

Highway Engineer  
Division of Management  
U. S. Bureau of Public Roads

THE amount of explosives required per cubic yard of identical pay materials is generally larger in highway grading than in most lines of rock work, since it is so essential that all the material be broken into fragments small enough to permit the fast and steady operation of the shovel. In most highway work, this does not mean the use of exceptionally large single charges but rather closer spacing of holes, lifts of moderate depths, and a careful proportioning and placing of the charges of the proper kind of explosive so as to utilize best the full force of the explosion in loosening and shattering the material.

In very hard, tough material the holes should always be sprung so as to form a cavity or chamber of sufficient size to accommodate most of the charge at the bottom of the drill hole. The same is also true of deep holes in the softer rocks, except when the danger of losing the hole by the springing is too great. To form this cavity in hard rock may require the firing in each hole of as many as five or six gradually increasing successive charges of high-strength explosive. On most of the jobs studied one to three successive charges usually proved sufficient to spring the holes, although one single hole has a record of 16 successive charges.

The following table shows for a number of jobs the amount of explosives used both for springing and blasting and also certain other pertinent data as to the type of explosive, average depth of holes, and the condition of the material after the blast. The two columns showing respectively average depth and average spacing of the holes give the arithmetical average for all holes for which complete data were available. Since sidehill cuts predominated on all but three jobs, 1, 2 and 5, these figures give only a roughly approximate measure of either the actual depth or the actual spacing of the individual holes and were added only to give a general idea of the nature of the work.

This table shows that the average amount of explosive used per cubic yard of rock on each of these jobs varied from 0.50 to 1.90 pounds, and that the job using the smallest amount of explosive resulted in good breakage of the material while the breakage on the job using the most explosive was very poor. This helps to emphasize the fact that good breakage or fragmentation can be obtained fairly easily in some materials, but is difficult to obtain at all in others, and especially so in shallow cuts of tough material. The poor results on job No. 10 can be ascribed very largely to the fact that the holes were not sprung. Consequently, the charge in a 5-foot hole usually came within about 18 inches of the top, which was insufficient space for proper tamping even when 60 per cent dynamite was used. Near

the close of these studies, springing the holes three times with one-half, one and two 1½ by 8-inch sticks of 60 per cent dynamite was tried, with the net result that the use of the same total amount of explosive per cubic yard gave a better fragmentation with a spacing of 4 by 4½ feet, than had been obtained from a 3 by 3-foot spacing of unsprung holes. This wider spacing required only half the amount of drilling previously necessary.

AVERAGE AMOUNT OF EXPLOSIVES USED PER CUBIC YARD OF PAY MATERIAL ON SEVENTEEN TYPICAL JOBS

Job No.	Explosive per Cubic Yard			Condition of Material for Moving with Shovel	Kind of Material	Average Depth of Holes (approximate) Feet	Average Spacing of Holes (approximate) Feet
	Dynamite or Gelatin	Black Powder	Total				
	Springing Holes Pounds	Blast- ing Lbs.	Blast- ing Lbs.				
1	0.04	.....	0.85	0.89	Poor	Soft and seamy granite	30 25 by 18
2	.55	.....	.68	1.53	Poor	Hard basalt	18 19 by 19
3	.27	0.44	.....	.71	Good	Massive granite	14 10 by 8
4	.01	.....	.55	.66	Fair	Conglomerate	15 Variable
5	.25	.85	.....	1.10	Poor	Stratified limestone	16 15 by 12
6	.06	.....	1.06	1.12	Good	Shale	13 12 by 12
7	.02	.03	.45	.50	Good	Disintegrated granite	10 Variable
8	.15	.16	.67	.98	Fair	Stratified limestone and shale	12 10 by 10
9	.02	.17	.50	.69	Good	Seamy basalt	21 15 by 15
10	(*)	1.90	.....	1.90	Very poor	Hard granite	5 3 by 3
11	.25	.75	.....	1.00	Poor	Very hard granite	14 8 by 8
12	1.55	1.00	.....	1.55	Good	Very hard felsite	13 7 by 7
13	.14	.59	.....	.73	Fair	Hard schist	22 9 by 9
14	.10	.50	.....	.60	Good	Foliated granite	20 10 by 10
15	.18	.75	.....	.93	Fair	Hard granite	16 8 by 8
16	.15	.57	.....	1.02	Good	Very hard granite	16 8 by 8
17	.10	.47	.....	.57	Good	Soft granite	18 10 by 10

\* Near close of studies springing was begun, using approximately 0.30 pound of 60 per cent dynamite per cubic yard for springing and 1.60 pounds for blasting.  
† Part of this was used in burning the deeper holes to keep drills from sticking.

#### THE TRIAL SHOTS

In shale, hardpan, and some soft or partly disintegrated rocks the use of a black powder is usually preferable, as these blasting powders are much slower in action and give a very large volume of gas which exerts a lifting or heaving action that is very effective in this type of material. The ordinary black powder can only be used in dry holes; and, since both sidehill and through cuts in road work are likely to be more or less wet, a low-strength, slow dynamite or blasting gelatin must generally be used. Because of the prime importance of insuring good fragmentation the use of a rather high-strength dynamite or blasting gelatin is generally found most satisfactory for the harder rocks.

For the first trial purposes, a blasting charge of 1 to 1½ pounds of 50 per cent or 60 per cent dynamite or its equivalent per cubic yard of burden is suggested for untried material of a hard and tough character.

For the first trial only enough holes should be drilled and fired to make a fair test of what this spacing and loading will do in the given material. From this evidence either the spacing or the loading or both should be modified as the results indicate to be necessary or advisable. The following table is intended for trial use only where the depth of cuts is between 5 and 20 feet.

SUGGESTIONS FOR SPACING OF DRILL HOLES AND AMOUNTS OF EXPLOSIVES FOR THE FIRST TRIAL SHOTS IN UNFAMILIAR MATERIALS WHERE HARD SHOOTING IS PERMISSIBLE

Type of Material	Spacing of Drill Holes*		Coefficient* of Depth of Hole Below Grade	Pounds of Explosive† Per Cubic Yard of Burden	Use an Explosive Equivalent to—
	a	b			
Any rock exceptionally difficult to shatter.....	½	½	½	1½	60 per cent straight dynamite
Most hard, dense, unweathered ledge rock..	¾	¾	¾	1	80 per cent straight dynamite
All medium hard, weathered, or partly disintegrated rock; those which shatter readily and very hard shales.....	¾	¾	¾	1 to 1½	40 per cent straight dynamite or blasting powder if holes are dry.
Ordinary shale, hardpan, and similar materials..	1½	1	¾	¾ to 1	Blasting Powder if holes are dry; otherwise 20 per cent straight dynamite.

\* See diagram showing spacing of drill holes.

† The loading suggested is net amount of explosives for actual blast and does not include amount required for springing holes.

The procedure for finding the actual amount of explosive which should be placed in each hole is as follows: measure the depth of the hole, its distance from the next hole in the same row, and also the distance from the hole to the face or to the next row of holes.

Multiply these three distances together and, if in feet, divide the product by 27. The quotient is the "burden" on this hole in cubic yards. Multiply this burden by the amount of explosives to be used per cubic yard. This gives the amount of explosive to be placed in that hole. Thus, if a hole is 13 feet deep and the spacing is 6 and 7 feet respectively, then the burden is

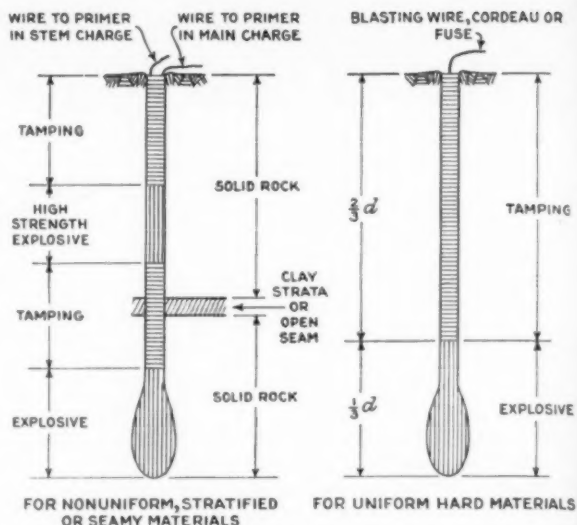
$$\frac{13 \times 6 \times 7}{27} = 20.2 \text{ cubic yards.}$$

If the rock is very hard and tough so that 1½ pounds of dynamite are required per cubic yard, then the charge for this hole will be

$$20.2 \times 1\frac{1}{2} = 22.7 \text{ pounds}$$

For shale, hardpan, or soft or partly disintegrated materials the trial charge might well be a coarse blasting powder; or, if the holes are wet, a slow dynamite should be used. If the ground will permit springing without the loss of too many holes they should always be sprung sufficiently to chamber practically the entire charge and should be loaded and tamped as shown in the diagram.

When there are intervening or alternating horizontal strata of hard and soft material, closer than normal spacing will usually be required and a portion of the charge in the form of dynamite should be placed in the stem of the hole within the hard strata as indicated in the figure. These auxiliary charges in the stem should all be fired simultaneously with the main charge by means of independent caps and primers wired to



*Suggestions for Locating the Blasting Charge. Holes Should Be Sprung Until the Desired Amount of Explosives Will Not Occupy More Than One-Third of the Total Depth. In Material Which Is Hard to Shatter Properly, a Small Charge of High-Strength Explosive Should Also Be Placed in the Stem Whenever the Distance to the Nearest Hole Exceeds 8 Feet. No Stem Charge Should Have Less Than 2 Feet of Tamping Over It.*

the same circuit. This method should give fairly satisfactory results as far as fragmentation is concerned, provided that the greatest spacing of the holes and rows in fairly hard or tough material is not more than three-quarters the depth of the cut, and that these holes penetrate sufficiently below grade to leave no hard, projecting points between adjacent holes. If the trial blast shows insufficient fragmentation the amount of explosive may be increased, or if much of the material is broken too large the spacing should be decreased. Since the burden on any hole of a given depth varies directly as the product of the spacings between holes and rows, the amount of explosive placed in each hole should be varied proportionally whenever the distance between holes and rows is increased or decreased.

Special care should always be taken to make certain that the holes along the ditch or slope lines are placed and spaced correctly and are of sufficient depth to insure full breakage to the bottom of the established ditch line. In deep holes of difficult materials where the requirements as to slope smoothness are severe it is frequently advantageous to drill the slope or ditch holes at about the same angle as the specified side slope. Then, instead of placing the entire charge at the bottom of the hole, a part is placed in the stem as a secondary charge which is primed and wired so as to explode simultaneously with the main blast.

#### CLOSER SPACING FOR LIGHT SHOOTING

Where heavy shooting is not permissible the only way in which good fragmentation can be obtained is by a closer spacing of the holes. But drilling is expensive. A foot of drill hole seldom costs less than a pound of good grade explosive and frequently as much as 2 pounds. The spacing should therefore be the greatest

at which sufficient fragmentation to permit easy shovel operation can be achieved within the limits of the heaviest permissible shooting. In very hard, tough rock this maximum permissible spacing is sometimes as low as one-half and seldom exceeds three-quarters the depth of the cut for cuts less than 16 feet deep, and probably rarely exceeds 12 feet of the actual distance for cuts over 16 feet, unless supplementary charges are placed in the stem of the original or master holes and also in holes which have been drilled to within one-third to one-half the depth of the cut near the middle of each quadrilateral formed by four deep holes.

#### SUMMARY

The sole purpose of drilling and blasting in highway grading work is to condition the material for removal readily with a power shovel. Moreover, the daily or hourly cost of the power shovel grading outfit is high—usually between \$15 and \$25 an hour—and is practically constant whether the rate of production is high or low. Low production cost can therefore only be obtained through high production; but in order to maintain a high production rate the blasting must be thorough and sufficient to shatter the material into fragments small enough for ready handling by the shovel. The blasting must also proceed sufficiently ahead of the shovel so that there will be no appreciable delay from waiting for the blasting to be done. This means, in general, that the blasting of each cut should be completed before the work is begun on that cut by the shovel. On this account, road work seldom affords much opportunity for firing the various rounds against a free face as in quarry work. As a result, relatively more explosive is required and relatively closer spacing of holes is necessary to insure proper fragmentation.

Perhaps the most significant feature disclosed by this study of drilling and blasting in highway grading work is the very general absence of that grade of supervision, organization, and matured planning which is given to the remainder of the job. Frequently all decision as to such important points as the location, spacing, and depth of holes is left entirely to the drillers. Too often this results in the holes being placed where it is convenient to drill rather than where they will do the most work. This lack of planned direction usually also extends to the method of loading and the amount of explosives used in each individual hole. With such conditions forming the general rather than the exceptional practice, there is no wonder that nearly three-quarters of all rock jobs reported the shooting as unsatisfactory from the point of view of fast, easy shovel operation. All the available data indicate that the cost of this poor shooting is as high and, if we include the usual pop holes to attain grade and the block holes and mudcaps necessary to break boulders, frequently much higher than on those jobs where the shooting is good. For similar conditions and materials, the poorly-shot jobs often actually pay more per cubic yard for their drilling and blasting than do those jobs on which the shooting is good, and in addition carry the penalty of a low rate of production on the part of the shovel. The conclusion therefore, seems inescapable that, under present close margins of bidding, the grading contractor who wishes to remain in business cannot afford to permit poor shooting on his rock jobs.

## Change in Methods in Old Loop Levee Enlargement

(Continued from page 26)

dumped the cars and the other four pulled them back and latched them. With this organization an 8-car train was dumped and on its way back to the dragline in 1½ minutes. The trains were passed on a switch at the dragline so that with one train on the track near the dragline, the other could run around behind the first train on a switch away from the dragline and then be in position to pull up immediately after the loaded train had cleared.

There were times when the first train had not returned from the dump when the second had loaded. This was due at times to the over-zealous locomotive engineers who had a tendency to drive a bit too fast for the weight of the train and rails and thus run off the track. When there were any delays for any reason whatsoever the dragline operator spent the time pulling in the far dirt and piling it ahead of the dragline. Thus when the train pulled in there was a short swing to get the dirt for loading and a minimum of loading time.

During the day shift, two men used a 2-mule plow team to break sod on the section being enlarged. The specifications required a 25 per cent allowance for shrinkage. Because of the unstable ground on which the enlargement was being made the contractor took advantage of the use of subsidence gages to measure any possible lowering of the base of the levee because of the added load of the dirt in the enlarging section. These subsidence gages are 5-foot square steel plates 3/16-inch thick and are placed at the elevation of the ground level. The government permits payments for added dirt if the ground subsides at these gages and allows 50 feet on either side, thus making payment for an equal settlement over one full station.

The new levee section was topped out with the dragline by pulling dirt up the slopes with the dragline not on top of the levee. A Kohler 1,500-watt portable electric plant was mounted in a house on skids so that it could be moved readily from one part of the job to another by the tractor. A string of six 200-watt lights and two 100-watt lights were used on the dump.

#### PERSONNEL

This 200,000-yard levee enlargement 4,100 feet long was awarded to the Sternberg Co., Inc., of St. Louis, Mo. On this particular section Stacy McAdams was Superintendent for the Sternberg organization. The work was done under the direction of Major T. B. Larkin, District Manager, Vicksburg District, with H. K. Doyle, Area Engineer, Lake Providence, La., in charge in the field.

## Simplified Practice Recommendation Covering Asphalt

**S**IMPLIFIED practice recommendation No. 4, covering asphalt, has been reaffirmed, without change, by the standing committee of the industry according to an announcement by the division of simplified practice of the Bureau of Standards. This action is based on a recent survey of production which showed that 94 per cent of the asphalt produced by the sixteen companies reporting conformed to penetrations recommended in the simplified schedule.



## Building America's Roads Safely

By  
**Thomas W. Walton**  
*Comptroller*  
**Henry W. Horst Co.**  
*Philadelphia, Penna.*

**I**N some states there are erected at particularly dangerous highway crossings or curves, white crosses, one for each fatal accident that has occurred at any spot so marked. Gruesome but effective, their white arms bear silent witness day and night to the dangers of the road. It is well for the comfort of those of us who have had to do with the construction of highways that there are not crosses of another color, some of them red perhaps, telling of other lives that have literally gone into the construction of the highway. Were we to place reminders of some type along the highways for all serious accidents, all lost-time accidents, let us say, it would be an unfeeling contractor indeed who would not leave his car behind whenever possible to ride the rails or take to the air.

It is impossible to lay down rules by which "no-accident-built" highways can be constructed. Each contractor and each job has its own special problems, but there are a few suggestions which, if followed, can help us toward that ideal. A few points which any organization should consider essential follow:

1. An experienced, dependable superintendent, clear of vision, free of bias, fair in all dealings and above all, considerate of his men.
2. Simple but clean and adequate headquarters where careful records are kept, first aid materials are always on hand, and where first aid is freely administered with *clean hands*.
3. A requirement that all injured persons report promptly for first aid; that field men report in triplicate, on insurance forms, every accident, regardless of how minor. One copy

goes to the insurance carrier, one to the home office and the third to the field office files.

4. Public liability and property damage cases reported with the same care and promptness.

5. A skilled mechanic who knows and keeps in proper repair all equipment; who does not wait for reports of evidence of needed repairs but who examines all equipment and allows none which is not in first class condition to be used. On small jobs this man can look after tools, explosives, etc., but he must be dependable and safety-minded. A negative essential which we shall not dignify with a classification number is No Drunken Drivers. A driver or operator of machinery who drinks is a dangerous employee.

If all these essentials have been observed and yet the coveted safety record has not been reached, we must remember that discouragement has no place in our program. Distressing experiences do come. Men will take chances against which they have been warned time and again, and the contractor comes to feel "What's the use?" The program of safety moves slowly, but the heaven is at work in the forces of general contractors, and high though our frequency rate may be, it is not nearly so high as where similar effort has not been expended. Let there be no let-up, for both humanitarian and economic reasons. There is no place for discouragement in this program.

### CARRY THE WORD TO NEW CONTRACTORS

Then too, the gospel must not only be practised but spread. In these times of unusual shortage in construction work in general, many contractors who have never before built roads are seeking to enter the field. Naturally hazards, new to them, arise. Costs are increased. All have cut to the quick in preparing bids, and in carrying out the contracts one of the first temptations is that of eliminating or at least reducing the safety program. These men must be told of the hazards. They must be told not only because of their inexperience but also because of the likelihood that in their employees on the road job there are many men who have hardly had tools in their hands before. Most organizations have some of these men in their employ these days, but the contractor new in the road building line is likely to have them in greater proportions. Therefore the gospel of safety must be spread!

When we see a damaged car or a broken piece of equipment,

(Continued on page 37)



Many Hazards in a Small Area—Hence the AGC Safety Poster, "Your Life—Help Us Protect It!"





# The Editor Comments

## Out-of-Date Construction Equipment

How many contractors realize that during the last two years when manufacturers have not been able to sell construction equipment, because of stagnation in the industry, they have been improving engines, drives and other features of construction machinery? The production department has been practically idle, but the research and development departments of our leading manufacturers have been active so that when we again reach a normal volume of construction, not a boom volume, the manufacturer will be ready to place in your hands a piece of equipment which will work more economically and far more satisfactorily than any you have known before.

What does this mean regarding your present equipment? It means simply that it is rapidly becoming obsolete. For several years most contractors have refrained from buying new equipment unless absolutely necessary. Breakdowns are expensive in lost time. Bids have been shaved unusually close so that profits were near the vanishing point even when the contractor secured all the breaks; but when the machinery breaks that puts an end to profits.

As one means of stimulating industry in general, A. W. Robertson has headed a drive to put new machinery and other equipment into factories all over the land. Since August, he and his fellow workers have been going about the country to persuade every kind of industry that this is the time to rehabilitate. Until the results were recorded, according to the *New York Sun*, there was considerable doubt about the response to this movement. The present report, however, shows a list of trades and industries that have announced their intention to spend altogether more than \$70,875,000 to remodel and improve their establishments. This means that hundreds of manufacturers have acted on their belief that this is the time to get ready for full-time operation. Will the construction industry be ready and properly equipped when we return to normal activity?

## Why Should Unfair Competitive Practices Be Countenanced in Times of Depression?

Bid peddling is one of the curses of the construction industry. It is altogether too common for contractors to bargain on prices after bids have been opened. If a contractor bases his bids on a price given by a material man or equipment manufacturer or distributor, knowing that the price is fair and that the giving of that price has entailed certain expenditures of time and

money, the contractor is morally bound to give his business to the company supplying the prices to him.

The practice of shopping around for still lower prices after the contract has been awarded, simply because the contractor is definitely in a position to place the business, is in utter violation of good business practice and business morals. In a resolution adopted by the National Conference on Construction this statement is made, "While the present adverse economic conditions make it difficult to eliminate unfair competitive practices, we believe that every effort should be made to establish the principle of adhering to original bid prices in relations between contractor and owner, general contractor and subcontractor, contractor and material supplier, and urge the support of all measures to insure the maintenance of fair practices . . . ."

There must be no let down in the war on bid peddling merely because we are in the midst of adverse economic conditions. Unfair competition contributed its share to the present economic situation and must not be countenanced any longer. Manufacturers, distributors, contractors and subcontractors who comprise the greatest industry in America must realize the responsibility and opportunity at this time to eliminate bad practices by immediate exposure. When there were hundreds of contracts with plenty to go around, bid peddling was "just too bad," according to most contractors. Now with the ratio of contractors to jobs greatly altered, bid peddling can be more definitely spotted and conditions changed for the better.

## Why Not BUILD Back to Prosperity?

It was a slowing up of construction because finances were devoted to quick profits in stocks in 1870-73 that caused the financial panic of 1873-79. It was a large program of railroad construction which increased employment, created orders for construction materials and equipment that turned the business tide and brought about the better years of 1879-83. The same road out of depression can be used today by building self-liquidating projects. The first article in this issue is an authoritative discussion of the outlook in the construction field for 1933. While its tone is more optimistic than many of us may feel at present, this optimism is not forced but is the result of a study of facts and funds available. Let us *build* back to Prosperity.

Theodore Reed Kendall

# Legal Points for Contractors

*These brief abstracts of court decisions in the contracting field may aid you in avoiding legal difficulties. Local ordinances or state laws may alter the conditions in your community. If in doubt consult your own attorney*

Edited by A. L. H. Street, Attorney-at-Law

## A Hazard in Public Construction Contracts

Lawyers are often blamed for their efforts to "dodge the law" for their clients—although the clients do not usually join in heaping the blame. If a lawyer cannot escort his client up the front steps and into the main entrance of a situation, he is supposed to be able to find some way of approaching from the rear or through a cellar window.

An interesting example of an unsuccessful attempt to get around a well-established principle appears in a case lately decided by the Appellate Court of Indiana (169 N. E. 77).

A contractor expended considerable money and time on a school building job before it was discovered that the school board had acted without legal authority in making the contract, because of statutory debt limits, etc. His lawyers evidently foresaw that it would be an uphill pull trying to collect from the district for, instead of trying that, they sued to hold the school district officers liable on the theory of a conspiracy between the officers, inducing him to enter into a contract that they knew, or ought to have known, they had no right to make.

But the court decided that the suit could not be maintained, because the contractor was bound himself to know all the legal limitations on the power of the board to act in the matter, and that the board was under no fiduciary obligations to the contractor. The court adds that a bidder or contractor for public work, "must examine the records and determine for himself whether the proper steps have been taken to enter into a lawful contract."

## When Does a Wrongfully Dispossessed Contractor's Damage Claim Accrue?

"We've decided to terminate your contract to construct a waterworks reservoir for us and you are hereby notified to leave the job and let us finish it," said the fathers of a city in Washington to the contractors.

"Oh, yeah," said the contractors and kept on plugging away on the job for more than four months longer, when the city came along and took possession.

Under the Washington laws, as under the laws in many other states, the contractors' damage claim had to be filed with the city in a case of this kind within thirty days from the date of the accrual of the claim. The contractors filed claim within that time after they were dispossessed on the job. But this was several months after the city had given notice of termination of the contract, and its counsel claimed that the thirty days ran from that date.

In the case of *Boyer v. City of Yakima*, 287 Pac. 211, the Washington Supreme Court decided that the notice was given within the time required by law. Said the court:

"We are of the opinion that appellants [the contractors] had the right to ignore the city's notice of cancellation of the contract on October 3, 1927, as a breach of the contract, especially since they were not then physically disturbed in the continuance of the work under the contract; and had the right to regard the taking from them by the city of the physical possession of the premises and work on February 9, 1929, as a breach of the contract—there then accruing a cause of action in their favor for damages on account thereof."

## Difference Between "Employee and Independent Contractor"

No matter how high may be one's aspirations to be a "big shot," or to have the title of one, it's money in one's pocket to be a plain ordinary "hired man," rather than an "independent contractor," when he is injured and the person or concern in whose service he was engaged at the time was not at fault for the accident.

To illustrate, in the case of *Van Watermeullen v. Industrial Commission*, 174 N. E. 846, the Illinois Supreme Court was confronted with the question whether a gravel hauler was an employee of a road contractor, in which case an award against the latter was proper under the Illinois Workmen's Compensation Act, or whether he was an independent contractor, in which case an award would be improper. Holding that the hauler was an employee, the court said, in part:

"One of the principal factors which determine whether a worker is an employee or an independent worker is the matter of the right to control the manner of doing the work, not the actual exercise of that right. . . . The length of time the deceased had been employed is immaterial. . . . The work may be such that very little supervision is necessary. The fact that payment is made by the piece or job is not necessarily controlling. . . . If the employer directs where to unload and how the unloading is to be done and retains the right to discharge the employee, the relationship of employer and employee is established. . . . The evidence here shows that the deceased and other truck drivers doing the same work furnished their own trucks and worked for the defendant at 30 cents per load per mile, or 60 cents for hauling a load two miles. They had to keep moving to hold their jobs, and other men loaded their trucks at the railroad and dumped them at the mixer. It appears that the employer controlled the loading of the truck, the destination of the load, the dumping of the load, the kind and quantity of material hauled, the distance traveled by the truck, the amount of pay received for the load and the right to discharge the employee, and, through the ownership and operation of the machinery which loaded the truck and the machinery for the disposition of the material hauled, the employer controlled the hours of the trucker's employment. The employee was thus subject to his employer's control as to terms, kind, results, and duration of employment sufficient to establish the relationship of employer and employee."

## Knowingly Filing Invalid Mechanic's Lien May Be Costly

Almost any court would be apt to decide what the Louisiana Court of Appeal decided in the case of *Flournoy v. Robinson-Slagle Lumber Co.*, 136 So. 194.

A material company filed a lien against a woman's property, although she was not liable on the bill and the time for filing a lien had passed.

The court not only upheld her suit to strike off the lien, with costs against the material man, but also allowed a judgment for \$150 as damages for anxiety caused by wrongful filing of the pretended lien.

*A Contributor to*

*No. 1*

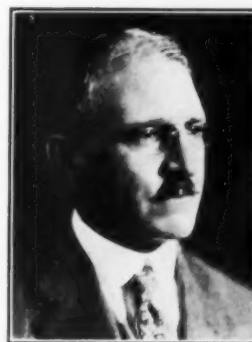
# Construction Progress

**F**IFTY years of engineering service has been Robert Ridgway's contribution to the progress of construction. Fifty years of honest and untiring effort and genius, in the fields of railroad, water supply and subway construction, brought him to the position of Chief Engineer of the Board of Transportation of the City of New York, from which position he retired October 31, 1932.

Mr. Ridgway's career started in 1882 as a chainman at a salary of \$40.00 per month. He began with the handicap of an inadequate technical education and met with all sorts of discouragements and advice to give up engineering, because of lack of training. He had no thought in those days that his career would carry him to the top of his profession, and he himself has said that it is probably just as well he did not foresee it, because it might have disturbed the rugged training, and the fight against discouragements and adversity which was so much a part of his early work.

In 1884 he was called from his railroad work in Northern Wisconsin to report as a leveller to the Chief Engineer of the Aqueduct Commissioners of New York City. From 1886 to 1900 he was Assistant Engineer on construction of the Croton Aqueduct and various reservoirs and dams. From 1900 to 1905 he was with the Rapid Transit Commission. Then he was appointed Division Engineer and later Department Engineer on construction of the Catskill Aqueduct. In 1912 he was called to the position of Engineer of Subway Construction for the Public Service Commission, First District, New York City, in charge of rapid transit construction for New York City and in 1921 became Chief Engineer of the Transit Commission. In 1916 and 1917 he was a member of the Chicago Traction and Subway Commission. In July, 1924, he was appointed Chief Engineer of the Board of Transportation of the City of New York, which position he held until his retirement last fall. Mr. Ridgway however has retained his associations with engineering activity and is at present Consulting Engineer for the Board of Transportation of New York City. In addition to his work for New York City, he is serving as Consulting Engineer for the Government of Japan for railways and Consulting Engineer on subways for Tokio and Osaka, Consulting Engineer for the Rapid Transit Subways of Chicago, Chairman, Board of Consulting Engineers, Transbay Bridge, San Francisco, and a member of the Colorado River Board on Hoover Dam. He is a past president of the American Society of Civil Engineers.

In his speech at a testimonial dinner given Mr. Ridgway upon his retirement he said, "It has been my good fortune to have been connected all my working life with the construction of public works and my privilege to



*Robert Ridgway*

help build them. I have found more happiness in my work than in what most people call recreation. The forces for construction of public works in this City constitute a small and efficient army of peace engaged in work that is designed for the welfare of the community. It is composed of all arms of the service; administrators, engineers, competent contractors with their technical men, trained superintendents and foremen, and skilled workmen. . . . I often wonder if the public has ever tried to estimate the value of this army of specialists. Without it, the work that is done would be far less efficient, and more hazardous and more costly. I am proud to have been a part of it. The contractors take jobs to make a profit, of course, but with few exceptions they desire to do a creditable piece of work and are proud of what they accomplish. No sympathy is wasted by the public on those who have to take a loss, and there have been many of the old timers who have been driven to the wall after contributing in the way of losses to the work that the public uses."

It is characteristic of Mr. Ridgway that he attributes so much credit for his accomplishments to those who have worked with him. An editorial of the *New York Times* of October 24 said, in a comment upon his retirement, "Mr. Ridgway has been quietly and efficiently going about the business of designing and building subways that have been a model for the rest of the world, and setting an example of devotion and integrity in public service. Unfortunately the public wakes up to this only on the eve of his retirement after forty-eight years of duty, of which thirty-two were spent in solving the city's difficult transit problems. . . . For nearly half a century he worked in a glorious obscurity, holding himself aloof from politics and permitting no political interference in performing tasks which, in the opinion of General Goethals, were as formidable as any that had to be overcome in Panama."





C. E. Baker, Smith Booth Usher Co., Los Angeles, Calif., First Vice Pres., A. E. D.



E. K. Hurst, Western Material Co., Sioux Falls, S. D., Pres., A. E. D.



Robert E. Nixon, Nixon-Hasselle Co., Chattanooga, Tenn., Second Vice Pres., A. E. D.



A. C. Blaisdell, The Queen City Supply Co., Cincinnati, Ohio, Secy., A. E. D.



H. W. Fletcher, Fletcher Equipment Co., New Orleans, La., Treas., A. E. D.



E. W. C. Gierke, Gierke-Robinson Co., Davenport, Iowa



Victor L. Phillips, President, The Victor L. Phillips Co., Kansas City, Mo.

*Officers  
and  
Members  
of the  
Executive Committee  
of the  
Associated Equipment  
Distributors,  
the Annual Meeting  
of Which  
Will Be Held  
January 15-16, 1933,  
Detroit, Mich.*



Fred Mattheis, President, Hedge & Mattheis Co., Boston, Mass.



Thorman W. Rosholt, President, Thorman W. Rosholt Co., Minneapolis, Minn.



John C. Louis, President & Treasurer, John C. Louis Co., Inc., Baltimore, Md.



Roy C. Whayne, Roy C. Whayne Supply Co., Louisville, Ky.



## Annual Meeting of the Associated Equipment Distributors

**T**HE annual meeting of the Associated Equipment Distributors will be held on January 15 and 16, 1933, at the Hotel Statler, Detroit, Mich. The program for this meeting has been planned with particular care, and speakers have been selected who have a very definite message that will be helpful in the conduct of the equipment business.

The meeting will open at 9.30 A. M., January 15. The morning will be given over to the reception of new members, following which there will be an address by President E. K. Hurst, and the reports of the Secretary and Treasurer, after which the committees will give their reports. The afternoon will be given over to speakers on the following subjects: "What Sales Policy Will the Manufacturers Have in 1933, and How Will It Affect the Distributor?" by A. C. Blaisdell, Secretary, A. E. D.; "The Equipment Distributor and the Present Construction Scene" by Colonel Willard T. Chevalier, Publishing Director, *Engineering News Record*; and "Distributors Sales—Today and Tomorrow" by William H. Ziegler, Wm. H. Ziegler Co. On Tuesday the meeting will open at 9.30 A. M. with an address by John C. Louis, John C. Louis Co., whose subject will be "The Uniform Mechanics' Lien Act," following which H. P. Gillette of the Gillette Publishing Co., will speak on "Methods of Increasing Expenditures for Public Works" and Victor L. Phillips of the Victor L. Phillips Co. will offer "Some New Thoughts on Cost Distribution and Financial Statements." Following lunch on Tuesday, the first speaker of the afternoon will be Tom Dix, President, CONTRACTORS AND ENGINEERS MONTHLY, who will speak on "Real Understanding between Manufacturers and Distributors," followed by Chas. H. McAllister, Manager, Allied Construction Industries, speaking on "Controlled Credits—the Cure for Irresponsibility" and Carl E. Baker of the Smith Booth Usher Co. and First Vice President of the A.E.D., speaking on "Salesmen's Compensation for 1933."

### Speeding Up a Bay State Road Job

(Continued from page 28)

the skip hoist clutch and automatically sets the brake. The power loader skip is lowered by a hand lever, and, as it nears the ground, it closes the valve from the measuring tank into the drum and opens the one from the auxiliary tank into the measuring tank. A lever at the discharge end of the operator's platform permits the operator to disconnect all automatic operations set in motion by the raising of the power loader skip. The overhead storage tank for water has a capacity of 200 gallons which does away with loss of time waiting for water when the pressure is reduced on the hills.

This type of paver is more adapted to larger projects since it will pave about 3 miles of 10-foot width per week. The Massachusetts Department of Public Works has approved of this double-drum paver but does not approve of paving mixers working in tandem. The double-drum paver is entirely automatic, whereas tandem pavers are liable not to be as accurately controlled.

#### PERSONNEL

This contract was completed by Carlo Bianchi & Co., Inc., on November 23, 1932, under the personal direction of Peter M. Bianchi, President, and with Fermo A. Bianchi as Superintendent. For the State, the work was in charge of H. O. Parker, District Engineer, with John L. Day as Resident Engineer.

## Building America's Roads Safely

(Continued from page 32)

our first question is "Was any one injured?" This sounds and is humanitarian. Contractors are humanitarian. But there is another aspect of the question which is also important, and perhaps has had as great an influence in bringing about safety progress,—and that is a mounting insurance rate because of one's accident record. Many companies have launched whole-heartedly into safety campaigns and found financial gain by so doing. May many more save by observing safe practices, but let us not completely forget the humanitarian side.

Post your jobs well with the fine safety posters available these days. Let the men know that you are thinking safety, and thinking it primarily for them. Gradually they will get into step. Impress upon the superintendents and foremen that they are responsible for the safety and lives of the men under them. Literature should be placed in the hands of the men, accompanied by a word or two as it is passed out at noon hour or some unhurried time. Show them some personal interest, talk about their families and their children. Cooperation will grow.

The employee who is regarded as just so much energy and force in the work to be done senses this feeling in his employer. He may work faithfully and well, partly because he is a good worker and partly because of necessity. However, efficiency in a safety program anywhere depends upon the human relationship to a far greater extent than we have been accustomed to think. When we reach the point of proper human relationships with our employees, our roads will not only be better built, and more quickly built, but they will be more safely built because of the development of pride of the worker in his task and in the undertaking of his employer. Put it on the money basis if we must; save with safety, yes, but preferably let us do it from the humanitarian standpoint and through improved human relationships; then will these other things be added unto us.

From an address before the Twenty-first Annual Safety Congress, Washington, D. C.

### Contract Maintenance Adopted by New York State

**M**AINTENANCE work in the State of New York will be done, in part at least, by the contract method, it has been announced by the highway commission. According to *The Low Bidder*, all of the retread work to be done on the State's highways will be done by contract next year and there will be about 500 miles of this type of maintenance. This decision is the result of persistent work on the part of organized contractors, who through the A. G. C., have collected information on the relative costs of different types of maintenance work when done by contract and by state forces.

### Economics of Construction Management

**B**UILDING a road or structure of any kind is an operation requiring the coordination of machinery, materials and man power. Given these three things anybody can build, in time and after a fashion. However, to build efficiently and economically is the function of the contractor. Because of the variable natures of the original materials and equipment, coordination or management has become an involved procedure. To manage economically requires knowledge, skill, aptitude and experience. A recent book entitled "Economics of Construction Management" by J. L. Harrison, Division of Management, U. S. Bureau of Public Roads, is devoted to a discussion of the fundamentals of economics in management, taking up each problem in such a way as to indicate how to bid and how to make a profit. This book is published by the Gillette Publishing Co., Chicago, Ill., at \$3.75.

# How the Other Fellow Did It

## Construction Briefs

### Insuring a Clean Paver Skip

**197.** Paver skips that are not clean are an abomination. If the cement adheres to the skip there begins an accumulation of material that slows up the speed of emptying the skip on each cycle. Scraping the skip now and then while it is on the ground is the usual way to prevent this accumulation becoming a nuisance. On one job visited recently another method was used which eliminated the need of scraping and was almost automatic. A timber was mounted above the water tank on the paver. From this a bar was suspended with a spring holding it forward toward the paver skip. When the paver operator pulled on a cord which led from the bar to the operating platform, the bar was pulled back and when he let go the springs jerked the bar forward against the skip, giving it a sufficient jar to loosen all the adhering cement or damp sand. It worked very successfully and the skip was always free from any material that would slow up the flow into the mixing drum. 23.4.46

### A Well-Planned Asphalt Bucket That Prevents Splashing and Blowing

**198.** A construction superintendent of an ingenious turn of mind realized that there is considerable danger as well as loss of material when the asphalt, delivered by the pump from his heating kettle to the weighing bucket on the hot mix plant, either splashed as it reached the bucket or was blown about by a stiff breeze. He devised a special asphalt bucket which did away with all of this. The bucket was roughly V-shaped with the point cut off and a bottom piece welded in. At either end of the bucket were round holes plugged with cones. When the asphalt was weighed and ready to dump, a lever at the top of the bucket was dropped, raising the two cones and permitting the asphalt to run in two streams to the mixer. The large pipe from the pneumatic lift for the hot asphalt was carried well into the bucket to prevent blowing of the stream when delivering material. 23.2.66

### Paying for Batch Hauling by Subcontract

**199.** Numerous methods have been devised to keep track of the batches hauled by a subcontractor on a concrete road job. About the simplest method which operates successfully and is practically foolproof was developed by an Ohio contractor. It consists of a double card which when folded and punched gave a record for the truck driver and a record for the general contractor. At the top of the card were twelve spaces numbered from one to twelve, representing the months, and immediately below that a series from 1 to 31 for the days. The center of the card is devoted to a series number, the rate of payment, name of the general contractor, the name of the job, the name of the truck owner and the number of the truck. Around the bottom and one side are spaces for 36 numbers, representing 36 truck loads. Above and below each number is a zero, the upper one representing the loading of the batch at the batching plant and the lower one the dumping of the batch at the paver. The weigh man at the batching plant punched the first hole for the batches and the dump man at the paver punched the card again, giving a double check. At the end of 36 loads, the truck driver turned in one-half of this card and retained the other half and received a new double card. In this way no batches strayed between the batching plant and the paver on a long haul and no mysterious concrete foundations for chicken coops or silos appeared along the right-of-way. 23.5.62

### Setting Up a Job Saw Mill

**200.** The ordinary saw rig will handle a great many odd jobs, if the carpenter has any ingenuity. There are some electric hand saws today which perform what seems the impossible. A contractor on a tunnel job which required a lot of odd lengths of lumber and considerable form work set up a standard steel saw rig at one open end of a shed close by the lumber stockpile which was slightly to one side of the shed. On the same side a wedge shaped fence or permanent "horse" was built so that one end of each piece of lumber which was slipped from the stockpile could be rested on the horse and the other end swung around and placed on the bench at the left and then the lumber pushed forward onto the saw table. To permit lateral movement, a piece of pipe set with its ends in wood recesses with plenty of grease, furnished a convenient home-made roller which permitted the timber being moved across to cut various lengths with a minimum of effort. Where 4 x 12 and 6 x 12 lumber in 10 to 16-foot lengths was being handled, this made it possible for the carpenter and his helper to move the pieces around where ordinarily they would have needed one or two laborers to help them. 23.5.66

### A Trowel with a 10-Foot Handle

**201.** A common scheme used by finishers of concrete roads in central Illinois, but which has not been seen generally in other sections, devised to overcome the small blemishes on the slab, such as clods of earth or laitance that have not been removed by longitudinal floats or belts, is a small trowel firmly attached to the end of a 10-foot pole, usually of bamboo. This trowel is manipulated out over the slab and the small poor spots taken out with remarkable skill and speed. The handle of a small 2 x 3 trowel is inserted in the hollow center of the bamboo pole and then wedged and bound securely. 23.3.50

### Welded Pipe for Piling

**202.** A Midwest foundation contractor faced the problem of driving pipe piles 24 inches in diameter and 12 feet in length. At first screw couplings were considered but later he decided to weld the pipe which was fabricated from steel. The piles were driven to a depth of 72 feet with a steam pile hammer. Often after they had been driven 18 feet, they were straightened to a plummet, necessitating a considerable strain on the welds which stood up without fracturing even under 40 strokes with a 5,000-pound hammer. The pipe was fabricated from steel of 1/4-inch thickness and the longitudinal seams were welded at the rate of 36 feet an hour. The pipe was prepared for welding with a single bevel of 30 degrees. The 12-foot lengths were then fused into 36-foot sections. The pipe was given a single 30-degree bevel and placed upon a rotating fixture. The circumferential welds were made in a total time of eight minutes. 23.5.69

### Sprinkling the Grade

**203.** Almost any laborer is assigned to sprinkling the grade ahead of a paver on hot days. He uses the usual "thumb" method to form a spray and the water is liable to spread in most any direction, intentionally or otherwise. One contractor obviated trouble from this score by using the usual 3/4-inch hose attached to the paver with a flattened piece of copper tubing wired into the hose, giving a very effective spray which spread out evenly over the grade. 23.5.63

# Road Show Notes

**J. D. Adams Co.**, Indianapolis, Ind., will have on exhibition in Space Nos. 135 and 140 the new Adams motor grader No. 301, powered by a McCormick-Deering tractor; an Adams elevating grader No. 11, a fully motorized control machine; and an Adams leaning wheel grader of the high-lift type with a 12-foot blade which has just been announced. This grader has a wide range of blade adjustments, being capable of cutting a bank  $6\frac{1}{2}$  feet high at a slope of 73 degrees off horizontal as well as cutting  $6\frac{1}{2}$  feet outside the line of wheels for finishing shoulders and similar work. The exhibit will be in charge of E. E. Christena, assisted by a number of company representatives.



*The New Adams No. 112 Leaning Wheel Grader*

**Air-Maze Corp.**, Cleveland, Ohio, will exhibit in Space 336 its complete line of heavy-duty oil-bath type Air-Maze filters. A feature of the exhibit will be the new heavy-duty oil-bath type air filter No. 55-OB designed for the protection of all kinds of road building equipment where severe dust conditions are encountered. Representatives in charge will include W. G. Heacock, Sales Mgr.; C. R. Hall, Sales Dept.; W. L. Malotte, Michigan Rep.; and G. M. Walton, Vice Pres.



*The New No. 55-OB Air Filter*

**Alabama Asphaltic Limestone Co.**, Birmingham, Ala., will occupy Space 338, exhibiting samples of asphaltic limestone hot-mix and cold-lay pavement, as well as a special cold-lay mixture developed for thin seal coats on mixed-in-place or road-mix construction. The company will be represented by Wallace L. Caldwell, Pres., and J. H. Conzelman, Gen. Mgr.

**American Manganese Steel Co.**, Chicago Heights, Ill., will exhibit in Space Nos. 230 and 235, with A. W. Daniels, Vice Pres.; J. P. Murtaugh, Asst. to Vice Pres.; A. R. Sittig, Cleveland District Mgr.; B. S. Carr, Mgr., Pump Dept.; and P. I. Nagle, Pump Dept., in attendance. A feature of the exhibit will be the new AMSCO manganese steel renewable-lip one-piece power shovel dipper.

**Amiesite Asphalt Co. of America**, Philadelphia, Penna., will have on exhibition in Space No. 111 samples of Amiesite paving materials as well as motion pictures illustrating the handling of these materials. Those in attendance will be D. M. Hepburn, Pres.; Harlan Conly, Treas.; Perry A. Nicklin, Sales Mgr.; C. P. Elliott, Engr.; Richard Halton, Millard Hunt, Robert H. Fuller, W. H. Hall, Edward McLaughlin, George B. Carey, J. E. Cushing, C. A. Harrington, S. E. Johnson, Wm. S. Giles, Paul Townsend, Jos. M. Spears, Wayne C. Sutton, W. C. Bechtold, W. G. Drummond, W. C. Witt, M. F. Bramley, M. E. Payne, B. Dolan, Harold Bramley and George Vang.

**Anthony Co.**, Streator, Ill., will have on exhibition in Space No. 128 a Caterpillar Twenty-Five tractor equipped with an Anthony multiple tool, and the new Anthony hydraulic dump body. This multiple tool is a machine which can be used as a loader, bulldozer or a front end fresno by the easy and quick exchange of interchangeable parts. A feature of the 1933 line of Anthony dump bodies, one of which will be on exhibition, is the fact that this body can be used with all makes of chassis, regardless of the width of the frame or the location of the transmission and power take-off.

**The Asphalt Institute**, New York City, will occupy Space Nos. 126 to 132 inclusive and will exhibit a model showing asphalt road construction. The latest publications of the Institute will be available, including the newly simplified Specifications for Liquid Asphaltic Road Materials and Manuals No. 1 and No. 2 of the Asphalt Road Construction series, the latter on Surface Treatment Types being just off the press. Representatives of the Institute will include J. E. Pennybacker, Managing Director; Prevost Hubbard, Chemical Engr.; Bernard E. Gray, Highway Engr.; and Henry Krieger, Asst. Chemist.

**Austin-Western Road Machinery Co.**, Chicago, Ill., will exhibit in Space Nos. 137 and 138 its 1933 line of road building equipment. H. M. Kleiser, Vice Pres., and W. Cornwell, Mgr., Crusher and Roller Dept., will be in attendance.

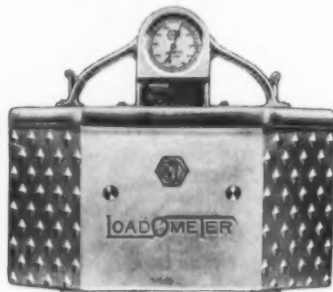
**Barrett Co.**, New York City, will have on exhibition in Space 142 roofing and building material in addition to the Tarvia and Tarvia-lithic line which is usually exhibited. Representatives of the company who will be present are P. K. Sheidler, Asst. Director of Sales; O. A. Brand, Mgr., General Tarvia Dept.; Paul Macy, Asst. Mgr., General Tarvia Dept.; George E. Martin, Consulting Engineer, all of the New York office; J. L. Lien, Mgr., Tarvia Dept., Chicago; A. D. Carpenter, Mgr., Tarvia Dept., Minneapolis; F. E. Banville, Mgr., Tarvia Dept., Columbus; and C. H. Olmstead, Mgr., Tarvia Dept., Birmingham.

**Bay City Shovels, Inc.**, Bay City, Mich., will have on exhibition a Model B  $\frac{3}{8}$ -yard-light  $\frac{1}{2}$ -yard full-revolving



full-crawler mounted convertible shovel and a Bay City trailer with dual pneumatic tires.

**Bendix-Westinghouse Automotive Air Brake Co.**, Pittsburgh, Penna., will occupy Space Nos. 301, 302 and 303 at the Road Show and will also maintain headquarters at the Book-Cadillac Hotel. R. M. Heinrichs, Gen. Mgr.; S. Johnson, Jr., Chief Engr.; R. H. Casler, Field Engr.; R. L. Morrison, District Mgr.; and A. E. Young, Rep., will be in attendance.



*The Black & Decker Loadometer  
for Weighing Trucks*

**Black & Decker Mfg. Co.**, Towson, Md., will have on display its line of portable electric tools applicable to the automotive industry and Turtle Back Loadometers, which are portable weighing devices used for weighing motor vehicles in the enforcement of weight regulations governing the operation of motor trucks on highways. The company will be represented by H. L. Prince, Testing Engr., and E. E. Powell, Mgr., Loadometer Sales.

**Blaw-Knox Co.**, Pittsburgh, Penna., will occupy Space No. 145 and will have on exhibition models and enlarged photographs of the new line of improved Blaw-Knox Trukmixers and closed agitators, steel forms for general concrete construction, batcher plants and central mixing plants, road forms, Ord finishing machinery for concrete and asphalt pavements, Universal forms for curb and gutter, integral curb and pavement construction, clamshell buckets, the Blaw-Knox Madsen line of portable asphalt plants and Ateco dirt moving equipment, consisting of dirt movers, bulldozers and tamping rollers. The company will be represented by Chester H. Lehman, Gen. Sales Mgr. and Seey.; Edward M. Ornitz, Sales Mgr.; Arthur A. Levison, Asst. Sales Mgr.; William A. Cochrane, Asst. Sales Mgr., all of the Construction Equipment Division,



*The Improved Trukmixer and Closed Agitator Body  
for Transporting Concrete*

and district managers and representatives from the various district offices of the company.

**Bond Manufacturing Corp.**, Wilmington, Dela., will have on exhibition in Space No. 370 its Cork-Tex expansion joint, a newly developed cork expansion joint for use in concrete construction. Those in attendance will be George F. Edmonds, R. C. Bostwick and Edward K. Bispham, Jr.

**Philip Carey Co.**, Cincinnati, Ohio, will have on exhibition in Space No. 148 Elastite premoulded expansion joint, rubber expansion joint, subgrade felt, asphalt plank and asphalt flooring. C. V. R. Fullenwider, Mgr., Elastite Products Div., will be in charge.

**J. I. Case Co.**, Racine, Wis., will exhibit in Space No. 122 a Model LI tractor with dual pneumatic rear tires, as well as moving pictures. Those in attendance will be George W. Iverson, Sales Mgr., Industrial Div.; L. L. Hoaglin, Industrial Div.; Tolmer Nelson, Engineering Dept.; F. A. Wirt, Adv. Mgr.; M. R. Comer and J. F. Bartels, Industrial Salesmen.

**Centaur Tractor Co.**, Greenwich, Ohio, will exhibit the Centaur highway mower in Space No. 214. C. C. Stedman, Vice Pres. in charge of Sales, and C. B. Hall, Sales Engr., will be in attendance.

**Cleveland Tractor Co.**, Cleveland, Ohio, will have on exhibition in Space Nos. 137-A and 138-A a Cletrac 80 and



*Three-Quarter Front View of the Wooldridge Standard Hydraulic Trailbuilder. The Blade Is Powered Up and Down by Single Hydraulic Control and the Horizontal Adjustments Are Afforded by Screw-Jacks at the Operator's Seat.*

a Cletrac 35 with a Wooldridge Trailbuilder which will be shown in action. A feature of the exhibit will be a special apparatus embodying the features of the Cletrac steering mechanism, demonstrating the Cletrac patented differentially-controlled steering. L. D. Ogle, Sales Promotion Dept., will be in charge of the exhibit while others in attendance will be King White, Pres.; H. D. Hubbs, Asst. to Pres.; W. E. Miles, Sales Mgr., Industrial Div.; G. D. Groce, Service Mgr.; J. W. Montigney, Traffic Mgr., and D. A. Milligan, Equip. Sales Mgr.

**Concrete Surfacing Machinery Co.**, Cincinnati, Ohio, will have on exhibition in Space No. 105 the complete line of Berg surfacing machinery. M. Wetstein, Pres.; F. E. Aurand, Sales Mgr., Cleaning Tool Div.; and M. Wolfson, Transportation Dept., will be in attendance.





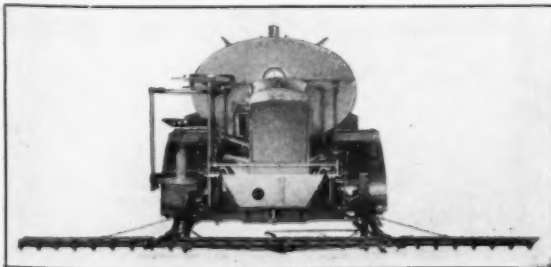
*One of the Curtis Model C  
Portable Compressors*

**Curtis Pneumatic Machinery Co.**, St. Louis, Mo., will exhibit in Space Nos. 227 and 238 the Curtis Timken roller bearing, carbon free Model C portable compressor line, the outfit to be on display being a 240-foot portable  $6\frac{1}{2}$  x  $5\frac{1}{4}$ -inch four-cylinder V-type unit mounted on four steel wheels. Representatives in attendance will be J. D. Lodwick, Sales Mgr.; I. B. Lewis and R. P. Stone, Sales Engrs.

**Dodge Brothers Corp.**, Detroit, Mich., will have on exhibition in Space No. 201 four trucks together with a complete parts display, including a Model G-30 E chassis and cab with a  $1\frac{1}{2}$ -yard contractor's dump body with hydraulic hoist; a Model F-60 E chassis and cab with a 3-yard contractor's dump body and hydraulic hoist; a Model G-43 2-ton standard chassis and a Model G-80 4-ton heavy-duty chassis. Representatives in attendance will be J. D. Burke, Director of Truck Sales; Allison Miller, Asst. Director of Truck Sales; D. C. McCallum, Detroit Regional Mgr. of the Fargo Motor Corp., and G. A. Orphal, Special Equipment Sales.

**Dow Chemical Co.**, Midland, Mich., will exhibit in Space No. 372 a display showing the uses of Dowflake calcium chloride for road maintenance and construction. Particular attention will be given to gravel roads, and the correct use of calcium chloride for maintenance work, as well as the construction and maintenance of sand-clay roads. Also the use of calcium chloride for treatment of sleet covered roads and streets to insure safe driving will be featured. Don Williams, Asst. Sales Mgr., will be in charge, with Fred Koch, Asst. Mgr., New York Office; H. Knowles, Salesman; George Hemmerick, Ontario Sales Engr.; Frank Whaley, Missouri Sales Engr.; G. F. Metcalf, Michigan Sales Engr., and V. B. Redfern, Michigan Sales Engr., also in attendance.

**E. D. Etnyre & Co.**, Oregon, Ill., will have on exhibition in Space No. 309 movies and photographs of Etnyre equipment, featuring the latest Etnyre distributor equipped with the new circulating spray bar which is designed with a



*The Etnyre Model FO2C 800-Gallon Distributor  
with the Circulating Spray Bar in Operating Position*

valve at each nozzle to provide instantaneous action and prevent drip from the nozzles after spraying.

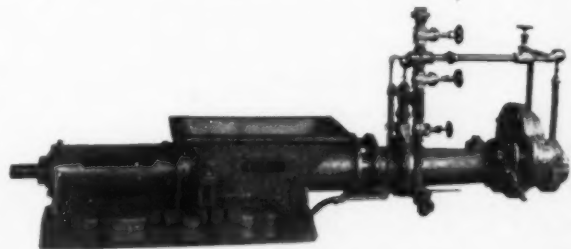
**Euclid Road Machinery Co.**, Cleveland, Ohio, will occupy Space Nos. 117 to 120, where the following equipment will be on exhibition: the new Tu-Way 10-yard dump wagon;  $1\frac{1}{2}$ -yard wheel scrapers; a 12-yard bottom-dump wagon, a 22-cubic foot rotary scraper and a Caterpillar Fifty equipped with a Euclid bulldozer. Those in attendance will be A. P. Armington, Pres. and Gen. Mgr.; E. F. Armington, Sales Mgr.; T. H. Taylor, Asst. Sales Mgr.; S. F. Armington, Chief Engr.; H. J. Zimmerman, Service Mgr.; J. K. Greer and V. D. Roland, District Reps.



*The New Tu-Way Dump Wagon*

**Ford Motor Co.**, Dearborn, Mich., will have on exhibition in Space Nos. 204 to 209 a line of trucks and small commercial units.

**Four Wheel Drive Auto Co.**, Clintonville, Wis., will occupy Space 113 where there will be on display two 1933 truck models, the H6 of 2 to  $2\frac{1}{2}$ -ton capacity and the CU6 in the  $3\frac{1}{2}$  to 4-ton class, and the Miller-FWD special racing car. Members of the FWD organization who will be present are: Walter A. Olen, Pres. and Gen. Mgr.; R. H. Schmidt, Gen. Sales Mgr.; H. B. Dodge, Chief Engr.; W. M. Hanson, Adv. Mgr.; R. W. Pachaly, Chicago Branch Mgr.; and H. G. Engel, District Rep.



*The Fuller-Kinyon Type F Stationary Pump for Un-  
loading Bulk Cement*

**Fuller Co.**, Catasauqua, Penna., will occupy Space Nos. 229-236 where there will be exhibited a portable Fuller-Kinyon pump for unloading box cars and barges, the new Type F stationary pump particularly designed for unloading bulk cement from hopper-bottom and tank cars and a single stage Fuller rotary air compressor, as well as photographs and movies illustrating recent construction projects.

where Fuller-Kinyon systems were used for handling the cement. The feature of the exhibit will be the new Type F pump for unloading hopper-bottom and tank cars, which may be driven by a directly connected gasoline engine or an electric motor and which, though designed for medium distance conveying, is claimed to convey cement 1,000 feet with a lift of 125 feet. G. K. Englehart, P. F. Stauffer, E. P. Meixsell and J. M. Alonso will be in attendance.

**Galion Iron Works & Mfg. Co.**, Galion, Ohio, will have on exhibition in Spaces 136 and 139 the new Galion Chief 10-ton road roller, complete with scarifier, with the new type hydraulic operation; a No. 14 hydraulic-operated pull-type grader with the new hydraulic feature; a No. 10 hydraulic-operated pull-type grader and a Galion E-Z lift motor grader, which has hydraulic operation, double drive, eight wheels and an 8-foot stone spreader. It is expected that the following members of the organization will be in attendance: J. L. Connors, Vice Pres. and Gen. Mgr.; J. S. Boyd, Vice Pres. in charge of Sales; H. G. Hulse, Sales Mgr.; C. F. Boyd, Sales Mgr.; R. E. Boyd, Vice Pres. in charge of Production; J. X. Farrar, Adv. Mgr., and A. D. Mahoney, Asst. Adv. Mgr.

**General Wheelbarrow Co.**, Cleveland, Ohio, will exhibit in Space No. 313 Empire highway guard rail, Empire grader blades and General wheelbarrows. J. M. Rorimer, Vice Pres., and Roger M. Kyes, 2nd Vice Pres., will represent the company.

**W. S. Godwin Co.**, Baltimore, Md., will exhibit in Space No. 103 its line of steel paving guards for protecting the edges of streets, roads, curbs and railway paving, as well as its new safety island. W. S. Godwin, Pres., will be in charge of the exhibit.

**Good Roads Machinery Corp.**, Kennett Square, Penna., will occupy Space No. 307 and will exhibit one of its roller bearing reduction crushers, a feature of which is the new adjustable stationary jaw which makes it readily convertible from a fine reduction crusher to a primary crusher, or vice versa. Those in attendance will be F. B. McKaig, Secy. and Treas.; W. D. Polk, Sales Mgr.; R. S. Tucker, Gen. Mgr., and M. A. King, Midwestern Rep.

**Goroco Mechanical Spreader Co.**, Philadelphia, Penna., will have on exhibition in Space No. 339 the Goroco chip spreader and in addition a working model and moving pictures to illustrate the operation and results obtained in spreading cover on fresh oil, and sand, cinders, etc., on icy highways. A. I. Dean and H. N. Beehtel, will be in attendance.

**Heitzel Steel Form & Iron Co.**, Warren, Ohio, will be represented by its usual exhibit and a number of members of the organization.

**Hercules Co.**, Marion, Ohio, will occupy Space No. 234 where there will be shown moving pictures illustrating Hercules equipment and featuring the Hercules Model 100 working on black top pavement. G. V. R. Mulligan, Mgr., Road Roller Sales, will be in charge of the exhibit.

**Hercules Motors Corp.**, Canton, Ohio, will have headquarters at the Book-Cadillac Hotel with D. W. Latta, Clyde R. Schuler, W. W. Cromley, C. P. Weekes, A. B. Wehling and John Keplinger in attendance.

**Hercules Products, Inc.**, Evansville, Ind., will have on exhibition in Space No. 217 Hercules dump bodies and the

Hercules-Ditwiler road spreader for use in road construction and maintenance, dust prevention with calcium chloride, and ice treatment. A feature of the exhibit will be the improved Model 202 heavy-duty tubeless hydraulic hoist straight-side dump body, a number of which have been purchased by State highway departments and municipalities recently.

**Chas. Hvass & Co., Inc.**, New York City, will have on exhibition in Space No. 141 the new Hvass Retread Mixer-Leveller recently developed for low cost highway construction. Chas. T. Hvass, Pres., and B. E. Priddy will be in attendance.

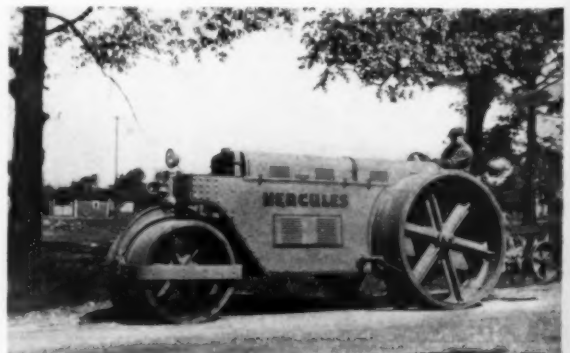
**Hyatt Roller Bearing Co.**, Harrison, N. J., will have an exhibit in Space 243 where the following members of the organization will be in attendance: H. K. Porter, Gen. Sales Mgr.; O. W. Young, Chief Engr.; H. M. Carroll, Adv. Mgr.; C. L. Newby, Divisional Mgr., Chicago; J. M. Kelly, Divisional Mgr., Pittsburgh; L. F. Stuebe, T. R. Russell, L. L. Hill and Frank Webster, Sales Engrs. This company will also have headquarters at the Statler Hotel.

**International Harvester Co. of America**, Chicago, Ill., will have on exhibition in Space Nos. 116 to 121 the Model A-7 heavy-duty International motor truck with dump body, the new T-40 TracTracTor, the McCormick-Deering I-30 industrial tractor and a special cut-away display of the final drive of the T-20 TracTracTor. A feature of the exhibit will be the T-40 TracTracTor, which has recently been developed, and which is powered by a 6-cylinder engine and has a five-speed transmission. T. B. Hale and W. M. Parrish will be in charge of the exhibit.

**Iowa Manufacturing Co.**, Cedar Rapids, Iowa, will have on exhibition in Space 112 the Cedar Rapids traveling-plant road-mix machine, a straight line one-piece gravel plant and batch-type pre-mix plants. Howard Hall, Pres.; Kenneth Lindsay, Vice Pres. and Sales Mgr.; J. D. Aldrich, District Sales Mgr., and A. C. Gossard, Asst. Sales Mgr., will be in attendance.

**Jaeger Machine Co.**, Columbus, Ohio, will share Space No. 144 with the Lakewood Engineering Co., where there will be a moving picture exhibit showing the application of truck mixers and in particular the application of the mechanical spreader to paving work. O. G. Mandt, Vice Pres. and Gen. Mgr., will represent the Jaeger Machine Co.

**Killefer Manufacturing Co.**, Los Angeles, Calif., will occupy Space Nos. 125 and 133 where there will be a



*A Model 100 Hercules Roller Working on Black Top*

# HELTZEL

## MORE—AND—MORE

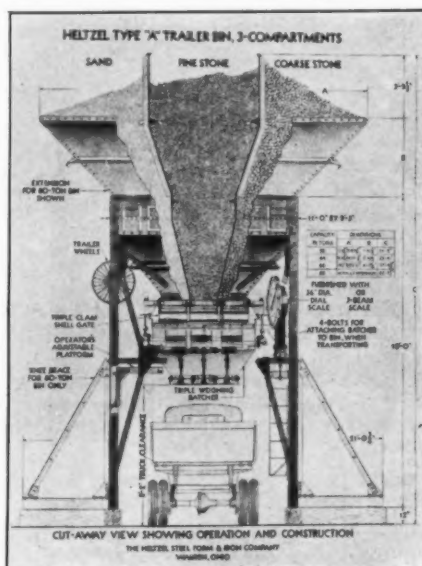
Contractors and Engineers are depending on  
Heltzel Equipment to see them successfully  
★ THROUGH—1933 ★

### HELTZEL PRODUCTS

STEEL FORMS—For building Roads, Curbs, Gutter and Sidewalks. STEEL BINS—Portable Batching Plants, Cement Bins, Central Mixing Plants, Rectangular, Square or Circular Bolted Bins, Batchers and Scales. Mechanical Spreader and Surfer, Road Joint Installing Machines, Finishing Tools and Miscellaneous Equipment. Special Forms for Manhole, Sewer and Tunnel.

### HELTZEL STEEL PORTABLE BINS

For Handling and Batching Concrete Aggregates



Heltzel 26 to 180-ton Batching Plants



Heltzel 50 to 335-bbl. Bulk Cement Plants

It pays—To protect your  
job with genuine—Heltzel  
Steel Road Forms



★  
More contractors pur-  
chased Heltzel Equipment  
in 1932 than in any pre-  
vious years.

THE HELTZEL STEEL FORM & IRON CO., WARREN, OHIO  
1933 ROAD SHOW—BOOTH NO. 211

Write for Descriptive Pamphlet



Killefer road disc or planer, a No. 10-A road ripper, a No. 67 revolving scraper, a No. 842-H hydraulic wheel scraper and a revolving self-cleaning road ripper on exhibition. C. G. Wuthrich, Eastern Rep., will be in charge assisted by H. W. Scharber, Southeastern Rep., R. T. White, Mgr., Peoria Branch, and O. P. Robb, Vice Pres.

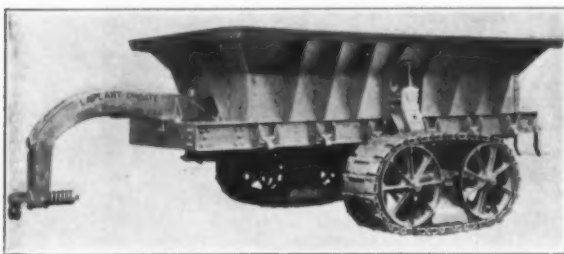
**Kinney Manufacturing Co.**, Boston, Mass., will occupy Space 106 and will show moving pictures demonstrating Kinney distributors in action, especially on penetration construction with coarse type aggregate, as used in Massachusetts. Those in attendance will be H. G. Saunders, Mgr., Kansas City Office; A. J. Munday, Mgr., Chicago Office; C. C. Hill, Salesman; C. D. Campbell, Jr., Mgr., Philadelphia Office, and W. E. Worcester, Vice Pres. in charge of Sales.

**Koppers Products Co.**, Pittsburgh, Penn., will demonstrate the various qualities and uses of Tarmac in Space No. 146. P. L. Griffiths and S. H. Scott will represent the company.

**La Bour Co., Inc.**, Elkhart, Ind., will have on exhibition in Space No. 141-A a La Bour self-priming centrifugal pump in actual operation and some of the gasoline-engine-driven portable pumps for contractors' service. H. E. La Bour, Pres., and William A. Da Lee, Detroit Rep., will be in attendance.

**Lakewood Engineering Co.**, Columbus, Ohio, will share Space No. 144 with the Jaeger Machine Co., where there will be on exhibition the Lakewood form tamper, a new device which rides the road rail and tamps the material on each side of the form. Lion Gardiner, Pres., will be in attendance.

**Lancaster Iron Works**, Lancaster, Penna., will exhibit in Space No. 362 one of the new Lancrick counter current rapid batch mixers. George A. Pockels, Sales Rep. for Illinois and Michigan, will be in attendance.



*The New 12-Yard Roadlayer Wagon*

**LaPlant-Choate Mfg. Co.**, Cedar Rapids, Iowa, will have on exhibition in Space No. 143 a LaPlant-Choate bottomless scraper, a bulldozer mounted on a Caterpillar Thirty-Five and a two-way dump wagon. R. E. Choate, Pres., and H. W. Graves, Vice Pres., will be in attendance.

**LeRoi Co.**, Milwaukee, Wis., will occupy Space No. 115 where there will be exhibited a 235-foot LeRoi-Rix portable air compressor, as well as a 4-cylinder  $2\frac{3}{4} \times 3\frac{1}{2}$ -inch gasoline power unit. Members of the organization who will be present are C. W. Pendock, Pres.; P. W. Eells, Asst. to Pres.; W. R. Karll, Sales Mgr.; and T. S. Tuttle, Asst. Sales Mgr.

**A. Leschen & Sons Rope Co.**, St. Louis, Mo., will have on exhibition in Space No. 244 samples of the different types and constructions of Hercules Red-Strand wire rope de-

signed for use on practically all types of road building equipment. E. J. Schillinger, E. E. Hiekok and Arnold Walters will be in attendance.

**Littleford Bros.**, Cincinnati, Ohio, will have on display in Space No. 129 a number of large photographs showing the features of the Littleford pressure distributor. L. W. Glaser, Sales Mgr., Road Equip. Div., and Herbert Haupt, Engr., will be in attendance.

**Lufkin Rule Co.**, Saginaw, Mich., will have on exhibition in Space No. 149 its line of steel and woven tapes and rules of various kinds for engineering construction work. R. M. Benjamin will be in charge of the exhibit.

**Macasphalt Corp. of America**, New York City, will occupy Space No. 147 where there will be on display samples of Macasphalt pavement. William P. McDonald, Pres.; O. H. Berger, Chemist; W. R. Yoakley, and John I. McDonald will be in attendance.

**Macwhyte Co.**, Kenosha, Wis., will occupy Space No. 238 where the various types of wire rope for construction equipment will be on display. A feature of the exhibit will be a demonstration of a special lubricant recently developed by this company for wire rope.

**National Carbide Sales Corp.**, New York City, will have on display at Space No. 226 the improved National Carbide V-G Handy-Light which has been redesigned to improve stability and appearance. More than 75 per cent of the weight of this light is in the bottom so that it is not easily tipped over but if it should be, no harm can be done, and it will produce 1,500 candle power for 5 hours on only  $1\frac{1}{2}$  pounds of National 14 N. D. carbide, which will also be on display. R. C. Holcomb, Service Mgr., will be in charge of the exhibit.

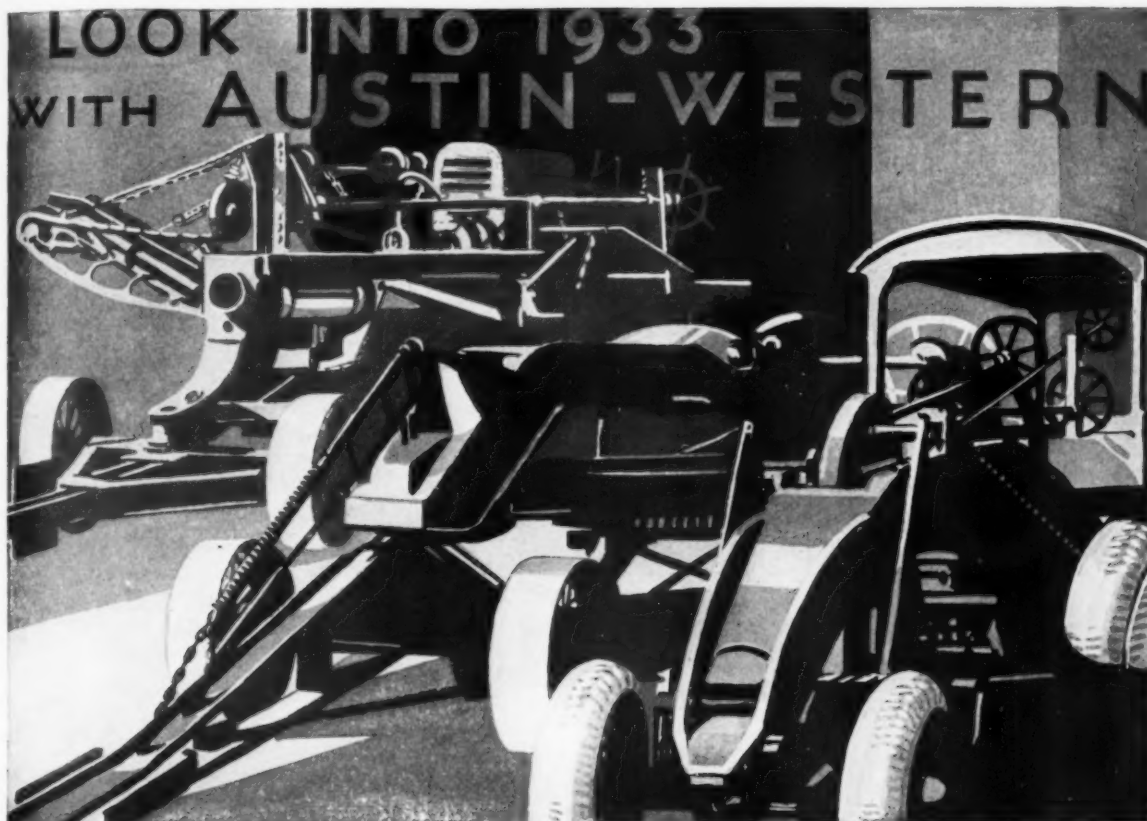


*A Handy Light for Night Work*

**National Paving Brick Association**, Washington, D. C., will occupy Space No. 104, the main feature of the exhibit being a miniature auger machine for making brick. G. F. Schlesinger, Chief Engineer and Managing Director, will represent the Association, with Quiney A. Campbell also in attendance at the booth.

**Tinius Olsen Testing Machine Co.**, Philadelphia, Penna., will exhibit for the first time the new Olsen hydraulic testing machine, 60,000 pounds capacity, and the Olsen-Smith Autographic, for use with this machine for making stress-strain diagrams, as well as the Olsen-Andrew road surface rater, with the Olsen master straight edge; a concrete beam tester in conjunction with collapsible moulds for preparing specimens; the latest automatic shot-type cement tester with dual weighing system; a ductility tester with Autographic; the Olsen-Mohr portable Brinell tester and the Firth Hardometer equipment for testing thin specimens; and the new Olsen-Nardiello capper for capping concrete test cylinders. This exhibit in Space No. 107 will be under the supervision of B. L. Lewis, T. L. Richards, C. R. Tait, and B. E. Ohlson.





## NEW Equipment with NEW Improvements for NEW LOW COST Operation



**ROAD SHOW**  
See our exhibits  
at the Highway  
& Building Con-  
gress, Detroit,  
January 16 to 20

Not just new models! The problems of 1933 are not to be solved by compromises with past practices.

Drawing to the full extent, upon the resources of 75 years of leadership—Austin-Western has achieved advances that make possible a new era of LOWER COSTS in road building and maintenance.

Months of engineering develop-

ment, grueling operating tests, and finally costly factory retooling—have all been undertaken with confidence that a solution to present-day economic demands could be attained.

These important developments can save you money in 1933, or make your money go farther. Write for full information to be released shortly.

# *The* Austin-Western ROAD MACHINERY CO.

ROAD ROLLERS, CRUSHING & SCREENING PLANTS, SCARIFIERS,  
SWEEPERS & SPRINKLERS, ROAD GRADERS, ELEVATING GRADERS.



MOTOR GRADERS, PLOWS & SCRAPERS, BITUMINOUS DISTRIBUTORS,  
DRAGS, SHOVELS & CRANES, DUMP WAGONS, SNOW PLOWS.

Home Office, 400 N. Michigan Ave., Chicago—Branches in principal cities.

Please mention CONTRACTORS AND ENGINEERS MONTHLY—it helps.

**Pioneer Gravel Equipment Mfg. Co.**, Minneapolis, Minn., will occupy Space No. 304 where a moving picture, "Producing Washed Concrete Aggregate" will be shown. W. H. F. Thompson, Vice Pres. and Gen. Mgr.; Lewis W. Yerk, Secy.; J. A. Hanratty, Vice Pres. and Sales Mgr.; O. J. Ellerton, Asst. Secy. and Treas.; and C. K. Ordway, Eastern Field Rep., will be in attendance.

**Portland Cement Association**, Chicago, Ill., will have an exhibit in Space No. 150 depicting the use of concrete for main routes, secondary roads, streets, sewage disposal facilities and concrete pavement at airports, with special emphasis upon the construction of cement-bound macadam for secondary roads. E. M. Fleming, Mgr., Highway and Municipal Bureau; W. F. Tempest and M. D. Catton will be in attendance.

**Ransome Concrete Machinery Co.**, Dunellen, N. J., will occupy Space No. 340 where the following members of the organization will be in attendance: W. Muller, Pres.; H. C. Peters, Midwest Mgr.; A. P. Robinson, Sales Mgr.; and R. M. McLean, Vice Pres. and Sales Mgr., Transit Mixers, Inc.



*Rex-Watson Tractor-Hitch Wagon Carrying a Load*

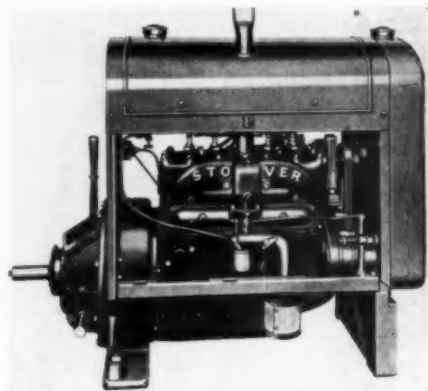
**Rex-Watson Corp.**, Canastota, N. Y., will exhibit the Watson dumper in Space 123. Those in attendance will be S. E. Ackerman, Sales Mgr., and Frederick Heath, Jr., Sales Engr.

**Sauerman Bros.**, Chicago, Ill., will exhibit in Space 233 a 2½-cubic yard Crescent hydraulic scraper for operation at the drawbar of a tractor, and will represent other Sauerman equipment with complete working models. The scraper is a new product which will be shown for the first time at the Road Show. Representatives at the booth will be L. E. Dierks, G. H. Tompkins, J. L. Nellis, J. N. Schu-freider and D. D. Guilfoil.

**Skinner Motors, Inc.**, Detroit, Mich., will have on exhibition in Space 371 three models of Skinner oil reclaiming systems. Those in attendance will be Walter S. Vance, Frank W. Brazel, Paul Williams, P. C. Walrath, James H. Skinner and A. D. Redner.

**Solvay Sales Corp.**, New York City, will have an exhibit in Space No. 208, calling attention to the various uses of calcium chloride and featuring particularly its use mixed with sand or cinders as an economical measure of safety on icy pavements. Those in attendance will be G. H. Kimber, H. C. Todd, R. A. Scott, G. P. Spence,

from the New York Office; F. L. Damon, F. G. Calkin, Syracuse Office; C. M. Adams, Jr., Boston Office; Wm. L. Ridpath, K. M. Dillabough, Philadelphia Office; V. R. Ewing, Chicago Office; C. A. Kleinhans, Cincinnati Office; G. E. Connell, Cleveland Office; R. M. Hoyt, Pittsburgh Office; F. H. Harris, A. Phillips, Jr., G. H. Baldwin, Detroit Office; and G. C. Schroeder, Grand Rapids Office.



*The New Stover 4-Cylinder Power Unit*

**Stover Manufacturing & Engine Co.**, Freeport, Ill., will have on exhibition in Space No. 130 the new Stover 4-cylinder power unit, which has a horsepower range from 10 to 16, and is simple and compact. Lee Madden, Vice Pres., and B. E. Avery, Asst. Sales Mgr., will be in attendance.

**Timken Roller Bearing Co.**, Canton, Ohio, will exhibit in Space No. 247 its line of Timken bearings. Those in attendance will be L. M. Klinedinst, Vice Pres.; W. B. Moore, Sales Mgr., Industrial Div.; S. M. Weekstein, Industrial Equip. Engr.; H. V. Fleming, W. F. Anderson, and G. W. Curtis, District Managers.

**Toledo Scale Co.**, Concrete Aggregate Div., Washington, D. C., will occupy Space No. 241 and will have on exhibition a Toledo moisture determination and compensation Auto-Gage, a remote indication Auto-Gage, a graphic recording attachment, automatic liquid control equipment with automatic tare mechanism and continuous motion pictures of installations of the Toledo method of proportioning concrete aggregates by weight. Colonel Sidney F. Mashbir, Director, Concrete Aggregate Div., and R. B. Longmate, Zone Engr., Concrete Aggregate Div., will be in attendance.



*The Working Model of the Sauerman Tautline Conveying Cableway on Exhibition at the Sauerman Booth*



Views of the new Mt. Vernon Memorial Boulevard connecting the nation's Capital with the home of Washington. Contractors: Roberts Paving Company, Salisbury, Md., and McDougald Construction Company, Atlanta, Ga. Carey Elastite Expansion Joint used throughout—supplied by Asbestos Covering & Roofing Co., Washington, D.C.

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TRADE MARK REGD. U.S. PATENT OFFICE

**Expansion Joint**



## “Makes Good Paving Better”

For over 20 years Carey Elastite Expansion Joint has been protecting concrete highways against expansion and contraction stresses. Engineers specify it to insure definite results—road builders know that it is stocked in all principal centers, insuring prompt delivery.

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ROLL ROOFINGS

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*A New 10-13-Yard Crawler Wagon*

**Trackson Co.**, Milwaukee, Wis., will have on exhibition in Space No. 110 the new 1933 model Trackson 10 to 13-yard bottom-dump crawler wagon. L. E. Dauer, Sales Mgr., and R. D. Houghton will be in attendance.

**Tuthill Spring Co.**, Chicago, Ill., will have on exhibition in Space No. 361 a full size section of the Tuthill spring steel guard rail. Martin Kidder will be in charge of the exhibit with C. W. Miller and H. T. Moore also in attendance.

**Universal Crusher Co.**, Cedar Rapids, Iowa, will have an exhibit of its equipment at Space No. 242 and also Booth 43 at the Book-Cadillac Hotel.

**Warren Brothers Co.**, Boston, Mass., will have on exhibition in Space No. 373 samples of Penolithic non-skid pavement. Roy F. Williams and W. L. Kirkland will be in attendance.

**Barber-Greene Co.**, Aurora, Ill., will have on exhibition in Space Nos. 206 and 207 movies showing the details and experiences of the Barber-Greene bituminous paver and finisher, showing the units working together as well as jobs where only the paver was used and a job where only the finisher was used, being fed by trucks. Other movies and photographs will show other B-G machines in operation, including ditchers, loaders, and conveyors.

## Vitrified Paving Brick Simplified Practice Continued

**T**HE revised simplified practice recommendation Number 1-32, covering vitrified paving brick, has been accorded the required degree of acceptance by all interests in the industry, according to an announcement by the Division of Simplified Practice of the Bureau of Standards, Department of Commerce. In the revised schedule, which was prompted by the results of a survey conducted by the standing committee of the industry, the 4 x 3 x 8½-inch vertical fibre lug brick has been included and the 3½ x 4 x 8½-inch vertical fibre lugless brick has been eliminated. The former size represents 22.6 per cent of the 1931 shipments of vitrified paving brick, while the latter averaged, during the past four years, less than 3 per cent. With these changes the new list of six recognized stock varieties will cover 75.9 per cent of the total shipments as compared with 56.1 per cent for the previous list.

## Welding on Subway Construction

*The savings realized through the use of electric welding on the new Independent Subway System, New York City, will be discussed and the methods used described in an article scheduled for publication in the February issue of CONTRACTORS AND ENGINEERS MONTHLY.*

# Construction Industry News

**LaPlant-Choate Mfg. Co., Inc.**, Cedar Rapids, Iowa, has announced the completion of negotiations with the Knapp Mfg. Co., Oakland, Calif., for the joint manufacture and sale of the earth moving products of each company. The Knapp company will handle distribution for all products of both companies on the Pacific Coast, while the sales and distribution in the middle west and east will be handled by the LaPlant-Choate Co. These companies will now market a complete line of earth moving products including bulldozers, scrapers, wagons, backfillers, road builders, tampers, ripper plows and pull scoops. The LaPlant-Choate Mfg. Co. will make the Knapp scraper in four sizes for use with the Caterpillar Thirty-Five, Fifty, Sixty-Five and Seventy.

**Rawlplug Co., Inc.**, New York City, manufacturer of screw anchors and holding devices, has recently announced the removal of its Cleveland office and warehouse from 2032 East 22nd Street to larger quarters at 1315 West 6th Street. Here the Cleveland branch office will continue to operate as in the past, carrying a complete line of Rawlplug products and providing truck delivery to all parts of the Cleveland territory.

**Central Iron & Steel Co.**, Harrisburg, Pa., has announced that, effective January 1, 1933, I. M. Smith became Advertising Manager of the company with headquarters in the principal offices at Harrisburg, Pa.

**Keller Tractor & Equipment Co.**, Detroit, Mich., has recently been appointed exclusive distributor for Bucyrus-Erie shovels, cranes and dragline machines; Blaw-Knox buckets, bins, batchers, forms and finishing machines; and Baker Mfg. Co.'s scrapers and snow plows, in the lower peninsula of Michigan.

**Wm. H. Ziegler Co., Inc.**, Minneapolis, Minn., has announced consolidation with the General Tractor & Equipment Co., the new company name being the same as heretofore, Wm. H. Ziegler Co., Inc.

## Cotton Fabric for Road Building

**C**OTTON fabric in road building has progressed from the stage of tests to major construction in a new 2½-mile section of cotton surfaced highway recently completed near Baton Rouge, La. This new road bed was laid on a base composed of sand, gravel and clay. After preliminary grading, an asphaltic coating was applied, rolled, another coat of asphaltic material applied and then the cotton fabric laid. This was an open weave fabric weighing approximately 4½ ounces per square yard. An asphaltic coating was applied over the fabric, road surfacing material was spread, and rolled. Later, a final top dressing of asphaltic oil and sand was laid and rolled.

In this type of construction, the cotton fabric forms a waterproof cover over the road bed, acts as a binder and gives added strength to the paving material and prevents raveling at the edges of the road. Cotton fabric is being used experimentally on a 600-foot section of dirt road in Louisiana to test the practicability in service of a cotton fabric binder and top surfacing applied directly to the base. In this case, the base was merely graded and leveled before application of other materials, at a saving of 8 cents per square yard by the elimination of customary additional preparation.



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FOURTEEN versatile "Caterpillar" Tractors hustle along important construction details for the builders of Hoover Dam. Their power, stamina, and traction come in handy at bulldozing shelves along rocky grades. They maneuver nimbly in close quarters to move and spot heavy equipment. They reach over cliffs with hoist and cable to transfer loads quickly and cheaply. After a flood, their broad, sure-treading tracks walked right over the silt and trash. And they speedily cleared away the debris from a diversion tunnel to save important time and money! "Equipped with a variety of appliances and apparatus and doing a multitude of jobs, 'Caterpillar' Tractors are undoubtedly the most ubiquitous equipment here," writes Six Companies, Inc.!

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TWENTY . . .	\$1450	FIFTY . . .	\$3675
TWENTY-FIVE . . .	\$1900	SIXTY-FIVE . . .	\$3850
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## A New Method of Handling Bulk Cement

**150** Sprout, Waldron & Co., 1260 Sherman St., Muncy, Penna., will be glad to send to those interested complete information on its method of handling bulk cement which consists of a combination of horizontal and vertical screws, the horizontal screw extending under the tracks for unloading cement from hopper or box cars, and the vertical screw conveying it to the storage bin.

## A New Type of Dump Wagon

**151** Rex-Watson Corp., Canastota, N. Y., will be glad to send to interested contractors complete information in regard to the new Rex-Watson Tractor Hitch dump wagon which is made in a variety of sizes for use with an make of industrial tractor, either singly or in tandem, and which is equipped with steel or Goodrich Zero-Pressure tires.

## Trucks for Contractors

**152** White Co., Cleveland, Ohio, will be glad to send full information and the name of the dealer near you for four well-known line of trucks: White, Studebaker, Pierce-Arrow and Indiana, which offer a complete range of models, sizes, and prices to meet the various requirements of the construction industry.

## Expansion Joints for Concrete Paving

**153** Complete information on the Carey Elastite expansion joint for protecting concrete pavement from expansion and contraction stresses may be secured by interested contractors and engineers from the Philip Carey Co., Lockland, Cincinnati, Ohio.

## Lights for Night Work

**154** The National Carbide V-G Handy Light, No. Y-199, which has recently been improved and the base redesigned to increase stability and appearance, and which produces 1,500 candle power for 5 hours on only 1½ pounds of National 14 N D carbide, is described in literature which the National Carbide Sales Corp., Lincoln Bldg., New York City, will be glad to send on request.

## Removing Irregularities from Concrete Surfaces

**155** The Hill surfacer which is designed to remove the bumps and irregularities from concrete and bituminous concrete pavements and which has a number of features which make for ease of operation and long life is described in literature which the H & H Manufacturing Co., Elyria, Ohio, will be glad to send on request.

## A New Primary Crusher and Bucket Elevator Unit

**156** The Pioneer Gravel Equipment Mfg. Co., Minneapolis, Minn., has announced the Pioneer Type II truck with primary crusher and bucket elevator, particularly designed for crushing caliche and other materials of a similar nature that require machinery capable of handling a large volume of materials per hour.

## A New 28-Horsepower Track Tractor

**157** The Model M tractor following the general design of the Model 35 and Model L and which weighs 6,200 pounds, has track shoes 12 inches in width, has four speeds forward and many other features of interest, is described in the latest bulletin and specifications which may be secured from the Allis-Chalmers Mfg. Co., Tractor Div., Milwaukee, Wis.

## A New Half-Yard Excavator

**158** Bucyrus-Erie Co., South Milwaukee, Wis., will be glad to send to interested contractors literature describing its new ½-yard excavator, known as the 16-B, which combines greater digging ability per pound of weight.

## A New Large Bottom-Dump Crawler Wagon

**159** A new circular, Form No. 323, describing the Trackson 10-13-yard bottom-dump crawler wagon which is equipped with the new 20-25-ton Trackson crawler wheels and was designed for greater hauling capacity, may be secured by those interested from the Trackson Co., 1323 So. First St., Milwaukee, Wis.

## A Steam Jacketed Asphalt Pump

**160** Literature describing the Kinney steam-jacketed pump for unloading asphalt or other bituminous materials from tank cars may be secured by interested contractors from the Kinney Manufacturing Co., Boston, Mass.

## Arc Welding Data

**161** A 20-page illustrated leaflet describing the features, characteristics and applications of the Westinghouse FlexArc welders may be secured by interested contractors and engineers by writing to the Westinghouse Electric & Mfg. Co., East Pittsburgh, Penna., and requesting Arc Welding Data Bulletin No. 16.

## A Convertible One-Half-Yard Shovel

**162** The Speeder B-3, a fully-revolving, fully-convertible gasoline ½-yard shovel, among the features of which are two speeds on all operations, in traveling, on the drums and in swinging; the independent cable crowd and automatic adjustment of the crowd cables when the boom is raised or lowered, is described and illustrated in literature which the Speeder Machinery Corp., 1201 South Sixth St., West, Cedar Rapids, Iowa, will be glad to send on request.

## Pumps for Contractors

**163** The complete line of C. H. & E. Mud-Hen diaphragm, centrifugal and force pumps, which are designed for the various services required by the construction industry, is described in literature which C. H. & E. Manufacturing Co., Inc., 120 East Mineral St., Milwaukee, Wis., will be glad to send on request.

## Angle Compound Air Compressors

**164** Sullivan Machinery Corp., 400 North Michigan Ave., Chicago, Ill., will be glad to send to those interested copies of its new Catalog No. 88-A, which describes and illustrates the new Sullivan angle compound air compressors for stationary installations.

## A Surfacing for Concrete Roads and Pavements

**165** Con-Tex, a free-flowing quick-drying liquid easily applied to the surface of fresh concrete, either portland cement concrete or any concrete containing quick-hardening cement, for the purpose of producing a more attractive and longer-wearing surface, is described in Bulletin No. 4 which may be secured from the Concrete Surface Corp., 342 Madison Ave., New York City.

## Steam Rollers for Macadam Roads

**166** Barber Asphalt Co., Iroquois Sales Dept., 1600 Arch St., Philadelphia, Penna., will be glad to send to interested contractors its literature describing and giving the specifications of Iroquois macadam rollers which are equipped with a vertical boiler and are designed for heavy-duty service.

## Six-Cylinder Trucks of 1½ to 2½-Ton Capacities

**167** Atterbury trucks, of 1½, 2 and 2½-ton capacities, which are designed for heavy duty and long life, are described and illustrated in literature which the Atterbury Motor Car Co., 342 Madison Ave., New York City, will be glad to send on request.

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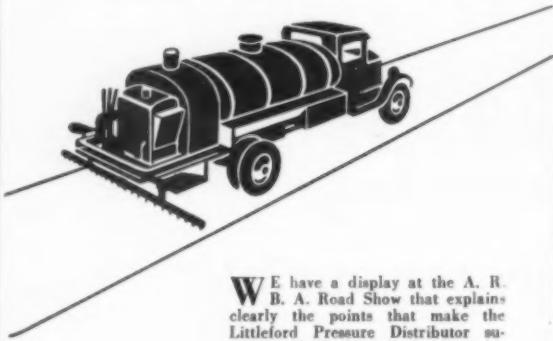
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## New Equipment Brings Profits

(Continued from page 50)

### A Portable Diesel Power Unit

**168** Bulletin No. 126 describing the Superior portable diesel power unit for rock crushers, concrete mixers, sand and gravel plants, dredge pumps, air compressors and similar equipment in several models and horsepower ratings, may be secured by interested contractors from the Superior Engine Co., Springfield, Ohio.

### Dump Truck Bodies and Hoists

**169** Stewart dump truck bodies and hoists in capacities of from 1 to 7 tons for road building, road maintenance, and general hauling requirements are described in literature which the Stewart Motor Corp., Buffalo, N. Y., will be glad to send on request.

### Automatic Impulse Starters

**170** Apollo Magneto Corp., Kingston, N. Y., will be glad to send to interested contractors its literature on Apollo automatic impulse starters, a device for securing easy starting of magneto-equipped engines.

### Contractors' Rubber Goods

**171** Goodall Rubber Co., Inc., Philadelphia, Penna., will be glad to send to those interested its literature describing its complete line of contractors' rubber goods, including various types and sizes of hose for air and water, couplings, concrete placing hose, rubber boots, oiled clothing and similar equipment.

### Sand, Gravel and Rock Pumps

**172** The Bryon Jackson sand, gravel and rock pump, which is of rugged construction and especially designed to meet the severe demands of such service, is described and illustrated in Bulletin No. 322 which the Bryon Jackson Co., Berkeley, Calif., will be glad to send on request.

### A Complete Line of Contractors' Equipment

**173** Literature describing the Worthington line of contractors' equipment, including rock hammers and drills, pavement breakers, diggers, tampers, portable, semi-portable and stationary air compressors, power pumps and accessories, may be secured by interested contractors from Worthington Pump & Machinery Corp., Harrison, N. J.

### Leaning Wheel Graders

**174** The Rome High-Lift leaning-wheel grader, features of which are durability, ruggedness, efficiency, and ease of operation, is described in literature which the Rome Manufacturing Co., Grader Dept., Rome, N. Y., will be glad to send on request.

### Tractors for Heavy Duty

**175** Linn tractors which are designed for heavy duty and difficult working conditions are described and illustrated in literature which the Linn Mfg. Corp., Morris, N. Y., will be glad to send to interested contractors on request.

### A High-Pressure Road Pump

**176** The Humdinger self-lubricating high-pressure triplex road pump for road builders and general contractors requiring a portable water supply plant is described in literature which the Ralph B. Carter Co., Hackensack, N. J., will be glad to send on request.

### Trough Conveyors for Stone, Sand and Gravel

**177** Porta trough conveyors for handling crushed stone, sand, gravel and similar materials, which are made with belt widths of 18 inches and lengths of 20, 25, 30, 35 and 40 feet, are described in literature which the Portable Machinery Co., York, Penna., will be glad to send on request.

### Emulsified Asphalts for Various Purposes

**178** Bulletin 1860 containing condensed specifications, chemical and physical properties and general instructions for the application of Headley emulsified asphalts for waterproofing, coating and cementing, and bonding may be secured by those interested from the Headley Emulsified Products Co., Franklin Trust Bldg., Philadelphia, Penna.

### A Durable Grab Bucket

**179** The Mead-Morrison Type MSD grab bucket, features of which are large diameter shafts, positive separation of inside and outside hinges, large oil reservoir, heavy plate shell, high carbon steel jaw 12 inches in width and high carbon heat-treated forged steel teeth, is described in Bulletin 133 which the Mead-Morrison Mfg. Co., 125 Prescott St., Boston, Mass., will be glad to send on request.

### Wheelbarrows and Concrete Carts

**180** The complete line of Jackson pressed steel tray wheelbarrows for contractors' use, with both wood and metal frames and in various sizes, styles and capacities, as well as Jackson concrete carts, is described in literature which the Jackson Mfg. Co., Harrisburg, Penna., will be glad to send on request.

### A New Tire for Tractor Service

**181** Complete information on a new tire for tractor service, a pneumatic companion to the Goodrich Zero Pressure tire, which is specially designed for road service and is known as the Tractor-Grader tire, may be secured by those interested from the B. F. Goodrich Co., Akron, Ohio.

### A Sand Spreader for Truck Mounting

**182** Bulletin KSS describing the Good Roads sand spreader, an independent unit consisting of a steel hopper, screw conveyor, spinner disc, gasoline engine, drive gears, shafting and bearings, all mounted on channels as a single unit for mounting on any standard truck chassis, and which spreads, under normal conditions, about 3 miles of sand 9 feet wide per hour, may be secured by those interested from the Good Roads Machinery Co., Inc., Kennett Square, Pa.

### A New Machine for Wet-Rubbing Concrete Construction

**183** Concrete Surfacing Machinery Co., 4559 Spring Grove Ave., Cincinnati, Ohio, will be glad to send to those interested complete information on the new Berg water-feed concrete surfacer for wet rubbing concrete construction which can be furnished as a complete machine, consisting of the water-feed head and any one of the Berg motor units, or just the water-feed head, known as Berg Model W, may be purchased as an attachment for Berg concrete surfacers now in use.

(Continued on page 54)



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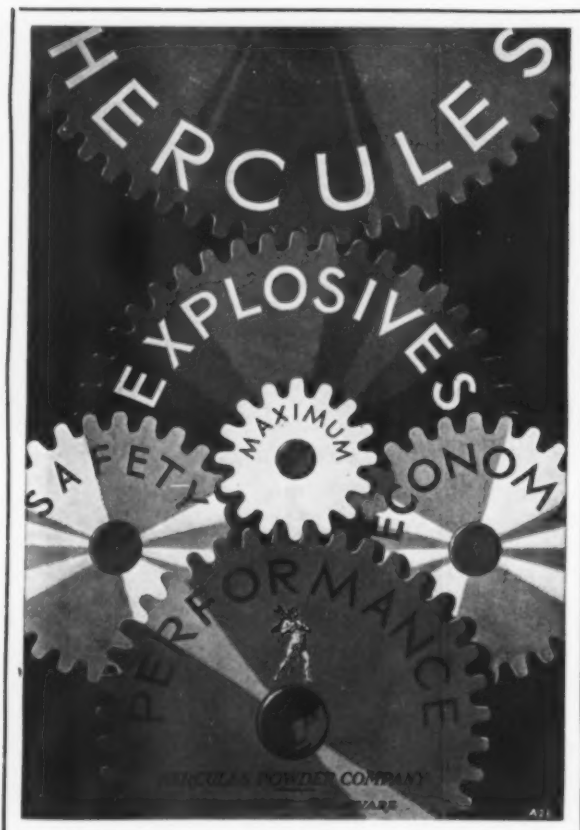
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## New Equipment Brings Profits

(Continued from page 52)

### New Features for Bituminous Distributors

**184** The 1933 line of Etnyre bituminous distributors have a number of new and interesting features, among them the circulating spray bar with a valve at each nozzle to prevent dripping from the nozzles after spraying. Complete information may be secured from E. D. Etnyre & Co., Oregon, Ill.

### An Adjuster for Black-Top Pavement

**185** The Gledhill road adjuster for leveling black-top pavements making uniform berms and adjusting road levels to any desired crown, which can be attached to a grader or supplied on its own chassis, is described in literature which the Gledhill Road Machinery Co., Galion, Ohio, will be glad to send on request.

### Bins and Batches

**186** The Erie AggreMeter plant, a self-contained unit for storing and batching aggregate, which can be easily moved from one location to another, and may be secured with one, two or three compartments, is described in literature which the Erie Steel Construction Co., Erie, Penna., will be glad to send on request.

### Roller Bearings for Construction Equipment

**187** Hoffman precision roller bearings for heavy loads and severe service are described completely in literature which the Norma-Hoffman Bearings Corp., Stamford, Conn., will be glad to send on request to those interested.

### Portable Air Compressors

**188** O. K. portable air compressors, which are made in two sizes, 120 and 240 cubic feet per minute and which meet the operating requirements for pavement breakers, rock drills, riveting hammers, and similar pneumatic tools, are described in literature which the O.K. Clutch & Machinery Co., Columbia, Penna., will be glad to send on request.

### Equipment for Sand and Gravel Plants

**189** Literature describing the line of Robins equipment for sand and gravel plants, including conveyors, crushers, screens, grizzlies, feeders, bins and similar equipment, may be secured by interested contractors from the Robins Conveying Belt Co., 15 Park Row, New York City.

### Power for Construction Equipment

**190** Waukesha engines, designed for structural rigidity, features of which are the girder crankcase with box-section base rib, full-power engine design, full-pressure lubrication and precision mounting at the bearings, are described in literature which the Waukesha Motor Co., Waukesha, Wis., will be glad to send on request.

### A Process for Strengthening Ground Structures

**191** The process of injecting a liquid mixture of cement, known as Cementation, into cavities, fissures, cracks or pores, and strengthening of the ground structure and making it impermeable to water or air, is described in literature which the Dravo Contracting Co., Pittsburgh, Penna., will be glad to send on request.

### Asphalt for Road and Street Construction

**192** The Texas Co., Asphalt Sales Dept., 135 East 42nd St., New York City, will be glad to send to interested contractors full information in regard to Texaco asphalt for use in street and road construction for durability and permanence.

### Asphalt and Stone Spreader

**193** Bulletin No. 141, recently issued by the Galion Iron Works & Mfg. Co., Galion, Ohio, describes and illustrates Galion asphalt and stone spreaders, the road widening spreader and the Galion mixing and leveling drag for mulch operation.

### Large Metal Culverts to Replace Small Bridges

**194** This is the substance of the latest catalog issued by the Armo Culvert Manufacturers Assn., Middletown, Ohio, on Armo Multi-Plate, the installation of which is quicker, easier and better than small bridges, thus saving time and money. Copies of this 32-page illustrated Catalog No. 10 may be secured without charge direct from the Association.

### A Scraper for Hard Digging

**195** Sauerman Bros., 464 So. Clinton St., Chicago, Ill., will be glad to send to those interested complete information on the new Crescent hydraulic scraper which can be used behind a tractor for grading, cut and fill and other dirt moving work, and which is made in various sizes for operation with tractors for all sizes and makes.

### A Sharpener for Well Drill Bits

**196** Complete information on the new WD sharpener for well drills which, according to the manufacturer, effects a saving of 50 to 60 per cent in drilling costs and 50 per cent in sharpening costs, may be secured by those interested from Ingersoll-Rand Co., 11 Broadway, New York City.

### A New Portable Screening and Crushing Plant

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*Inspection—Testing—Analyses*  
Cement, Aggregates, Concrete, Steel  
Bituminous Mixes and Materials, Paints  
and Creosoted Timber, Waters, Etc.  
1145 NW Second St. L. D. 584  
OKLAHOMA CITY, OKLAHOMA

# Contractors and Engineers Monthly

## DIRECTORY OF EQUIPMENT DISTRIBUTORS

The following cards (arranged by states) show the names of dealers in contractors' equipment and supplies, with a record of the various lines handled. Canadian cards appear on page 77.

### ALABAMA—ARKANSAS

**C. B. DAVIS ENGINEERING CO.**  
Brown Marx Bldg. Birmingham, Ala.

#### Representing

**ROBINS**—Belt Conveyors and Screens  
**ALDRICH**—Power Driven Pumps  
**FOSTER-WHEELER**—Pulverized Coal Equipment, Superheaters, Condensers and Boilers.  
**LO-HED**—Electric Hoists  
**INDUSTRIAL BROWNHOIST**—Locomotive Cranes  
**CLEVELAND**—Cranes  
**WHITCOMB**—Locomotives

**TURNER SUPPLY COMPANY**  
N. W. Corner of St. Louis & Commerce Sts.  
MOBILE ALABAMA

#### Representing

**McKIERNAN-TERRY CORP.**—File Hammer  
**INDEPENDENT PNEUMATIC TOOL CO.**—"Thor" Tools and Compressors  
**WILLIAMS**—Clamshell and Dragline Buckets  
**ORR & SEMBOWER**—Concrete Mixers & Hoists  
**AMERICAN STEEL & WIRE CO.**—"Monitor" Wire Rope  
**DOMESTIC**—Pumps and Hoists  
**M & M Form Clamps**  
**WYOMING SHOVEL CO.**—Red Edge Shovels, Scoops  
**LINK-BELT CO.**—Crawler Cranes, Shovels, Loaders  
**WESTERN WHEEL SCRAP-ER CO.**—Wheeled, Drags, Scrapers, Fresnoes, Ploughs  
**BATES**—Bar Tie  
**JAEGER-LAKEWOOD**—Concrete Mixers, Paving Equip., Chuting Equip.  
**BEEBE BROS.**—Hoists and Saws

**RONSTADT HARDWARE & MACHINERY CO.**

"Pioneers in Good Merchandise"

**TUCSON ARIZONA**  
**GALION** Graders, Rollers, etc.  
**McCORMICK-DEERING** Industrial Tractors, Engines  
**INTERNATIONAL** Motor Trucks  
**BAY CITY** Shovels, Cranes, Draglines  
**ORD** Concrete Finishing Machines  
**MUNICIPAL** Sprinklers, Flashers, etc.  
**STERLING** Hoists, Contractors' Pumps  
**AMERICAN "Truway"** Wire Rope  
**SPEARWELL** Oil Distributors  
**BROOKVILLE** Locomotives  
**POMONA** Turbine Pumps  
**MYERS** Pumps

**G. C. PHILLIPS TRACTOR Co., Inc.**  
1625-31 Ave. B. So. Birmingham, Ala.

#### Representing

**BAKER "Baker Maney"** Self-Loading Scrapers  
**BYERS** Full-Revolving Shovels and Cranes  
**CHAIN BELT "Rex"** Mixers, Pavers, Pumps, Saw Rigs, Etc.  
**DIXOYL** Lubricating Greases  
**GALION** Road Graders and Machinery  
**HAISS** Loaders and Conveyors  
**HEIL** Hoists and Bodies  
**HERCULES** Engines  
**HVASS** Heavy Duty Trailers  
**IOWA** Screening and Crushing Plants  
**TOLEDO** Torches  
Member: Associated Equipment Distributors

**Arizona Tractor & Equipment Co.**  
238 W. Jefferson St. Phoenix, Ariz.

#### Representing

**"CATERPILLAR"** Tractors  
**"CATERPILLAR"** Road Machinery  
**ATECO** Dismovers, Bulldozers, Tamping Rollers  
**ATHEY** Truss Wheels  
**BUFFALO-SPRINGFIELD** Rollers  
**DAY** Crushers  
**HEIL** Hoists  
**KILLEFER** Road Tools  
**LA PLANT-CHOATE** Snow Plows  
**LITTLEFORD** Asphalt Equipment  
**PACIFIC** Wire Rope  
**SPEEDER** Shovels  
**WILLAMETTE-ERSTED** Hoists  
**EUCLED** Earth Moving Equipment

**ARKANSAS FOUNDRY COMPANY**  
IRON AND STEEL

Little Rock Arkansas

#### Representing

**AMERICAN STEEL & WIRE CO.**—Wire Rope and Cable  
**NATIONAL STEEL FABRIC CO.**—Wire Mesh  
**MILWAUKEE CORRUGATING CO.**—Lath and Building Products  
**MAJESTIC CO.**—Coal Chutes and Building Products  
**IRVING IRON WORKS**—Subway Grating  
**CARTER BLOX-ON-END FLOORING CO.**—Industrial Wood Flooring  
**LINDE AIR PRODUCTS CO.**—Purex Welding and Cutting Equipment  
**DETROIT STEEL PRODUCTS CO.**—Fenestra Steel Sheet and Holorib Roof  
**SAINO MANUFACTURING CO.**—Automatic Fire Doors  
Also  
Structural and Reinforcing Steel and Steel Building Products

**SMITH-PITTMAN TRACTOR CO., Inc.**  
Tractors and Road Machinery  
520-26 No. 28th St. Birmingham, Ala.

#### Representing

**"CATERPILLAR"**—Tractors and Road Machinery  
**SPEEDER**—Full Revolving Shovels, Draglines  
**EMPIRE**—Cutting Edges, Wheelbarrows, Carts  
**EUCLED**—Crawler Dump Wagons, Power Scrapers  
**ATLAS**—Rotary Wheel-type Scrapers, Fresnoes  
**LAKEWOOD**—Finishers, Sub-grading, Machinery  
**BLAW-KNOX**—"Ball" Wagon Graders  
**KILLEFER**—Road Tools, Agricultural Implements  
**TOWERS & SULLIVAN**—Agricultural Implements  
**LA PLANT-CHOATE**—Wagons, Bulldozers, Scrapers

**NEIL B. MCGINNIS CO.**  
Box 2113 Phoenix, Ariz.  
753 E. Jackson St.

#### Representing

**Adams** Leasing Wheel Graders  
**Allis-Chalmers** Tractors  
**Barber-Greene** Conveyors and Loaders  
**Bramm** Rippers & Scarifiers  
**Bully Back** Fillers & Bulldozers  
**Erte** Road Rollers  
**General** Shovels, Cranes, etc.  
**Gardner-Denver** Portable Compressors, Jack Hammer, etc.  
**Goroso** Spreaders  
**Huber** Road Rollers  
**Jaeger** Concrete Mixers, Pavers, Pumps, Hoists  
**Junco** Wheel Scrapers  
**Le Tournau** Heavy Grading Equipment  
**Lima** Shovels and Draglines  
**Madsen** Portable Paving Plants  
**Master** Rotary Scrapers  
**Milwaukee** Gas Locomotives  
**Morton** Dirt Movers  
**Pioneer** Crushing, Screening and Loading Plants  
**Snow King** Rotary Snow Plows

**JOE LYONS MACHINERY CO.**  
Contractors' Equipment and Supplies

112 Louisiana St. Little Rock, Ark.

#### Representing

**REX**—Mixers and Pavers, Mortar and Plaster Mixers, Pumps and Saw Rigs  
**BLAW-KNOX**—Curb, Gutter and Road Forms, Batches, Bins, Clamshell Buckets, Truck Turntables  
**BARBER-GREENE**—Conveyors, Loaders, Ditchers  
**RED STAR**—Wheelbarrows, Concrete Carts  
**NOVO**—Hoists, Etc.  
**UNION**—Wire Rope  
**WAUKESHA-FULLER & JOHNSON**—Engines  
**BATES**—Bar Tie  
**P & H**—Power Shovels, Cranes and Draglines  
Also Quarry & Gravel Plant Equipment

**HAVE YOU CHANGED YOUR LOCAL ADDRESS?**

Sometimes in the rush of moving to a new location you fail to send us your new address. And as we are anxious to get your copy of the magazine to you on time do not put off writing us. Thank you.

**CONTRACTORS AND ENGINEERS MONTHLY**

470 Fourth Ave. New York

**MINE & SMELTER EQUIPMENT CO.**  
Construction & Mining Machinery  
306-12 South 7th Ave. Phoenix, Ariz.

#### Representing

**LINK-BELT** Shovels, Cranes and Draglines  
**LAKEWOOD** Mixers, Concrete Placing Equip.  
**NOVO** Hoists, Engines and Pumps  
**EDWARDS** Wire Rope  
**STRAUB** Milling Equip.  
**DIESEL** Engines  
**GARDNER-DENVER** Compressors, Rock Drills  
**HOBBART BROS.** Arc Welders

**KERN-LIMERICK, Inc.**  
115 No. Spring St. Little Rock, Ark.

#### Representing

**STOCKLAND** Graders, Small Road Tools  
**KOHRING** Pavers, Shovels  
**T. L. SMITH** Mixers and Pavers  
**INSLEY** Mast Hoists, Building Towers  
**PARSONS** Excavators and Backhoes  
**C. H. & E.** Pumps, Saw Tables and Hoists  
**CLEVELAND** Rock Drills, Air Tools, Etc.  
**RESILIFLEX** Guard Rail  
**JOHNSON** Bins & Batches  
**HUBER** Road Rollers  
**CEDAR RAPIDS** Crushers and Gravel Plants  
**SIDNEY** Steel Scrapers  
**SCHRAMM** Air Compressors  
**Drills, Tools, Etc.**  
**WICKWIRE-SPENCER** Wire Mesh and Cables  
**RIDDELL** Maintainers  
**ALLIS-CHALMERS** Tractors  
**LITTLEFORD** Asphalt Hot-tem and Equipment  
**GENERAL WHEELBARROW CO.**—Grader Blades, small tools, etc.

For Canadian Distributors, see page 77

## THE BROWN-BEVIS CO.

69th St. & Santa Fe Ave. Los Angeles, Cal.

### Distributors

Archer Towers  
Barnes Pumps  
Bay City Truck Cranes  
Buckeye Trench Machines  
Burch Stone Spreaders  
Carter Pumps  
Wendler Concrete Mixers  
Continental Engines  
Exiled Wagons & Scrapers  
Plymouth Locomotives  
General Shovel, Cranes

Hales Loaders, Conveyors  
Huber Gas Rollers  
Lidgerwood Hoists, Cable-ways  
Link Belt Shovels, Cranes  
Littleford Asphalt Heaters  
Michigan 3/4yd. Shovels  
Mortz-Bennett Shoulder Ma-chines  
Owen Clamshell Buckets  
Page Dragline Buckets  
Williamsport Wire Rope

Member: Associated Equipment Distributors

## SHEPHERD TRACTOR AND EQUIPMENT COMPANY

514-20 West 12th St. Los Angeles, Calif.

### Representing

"CATERPILLAR" Tractors  
"CATERPILLAR" Road Graders  
KILLEFER Scrapers, Scarifiers, Road Discs  
ATECO Dirt Movers, Bulldozers, Scarifiers  
ATHEY Truss Wheel Trailers  
JUMBO Scrapers  
LaPLANT-CHOATE Crawler Wagons, Bulldozers  
MASTEE Bulldozers, Trail Builders, Pipe Handling Equipment  
WILLAMETTE Hyster Winches for Tractors

## GARFIELD & CO.

Construction Equipment  
Hearst Building San Francisco, Calif.

### Representing

PLYMOUTH—Gasoline and Diesel Locomotives  
LINK-BELT—Shovels, Cranes, Draglines  
BAY CITY—Shovels, Cranes, Draglines  
AUSTIN—Trenchers and Backfillers  
LEACH—Mixers, Pavers, Saw Rigs  
ROLLER BEAR—Rock Crushers  
CLIMAX—Engines and Power Units  
MUNDY—Hoists and Derricks

## CONCRETE MACHY. & SUPPLY CO.

777 E. Gage Ave. Los Angeles, Calif.

### Representing

AMERICAN Cable  
BROOKVILLE Gasoline Locomotives  
BUTLER Bins & Batches  
BUCKYRUS-ERIE Shovels and Cranes  
BLYSTONE Products Mixers  
GLYDE Hoists & Derricks  
GARDNER-DENVER Compressors  
HANDY Back Cleaners and Batches  
TRACKSON Crawlers, Shovels

HOMELITE Pumps and Generators  
HOTCHKISS Road Forms  
INTERNATIONAL Industrial Tractors  
LE ROI Engines  
PARSONS Excavating Mchys.  
REX Mixers and Pavers  
RED STAR Wheelbarrows and Carts  
SERVICISED Expan. Joints  
STEARN'S Elev. & Conveyors  
WILLIAMS Buckets and Heavy Duty Trailers

Member: Associated Equipment Distributors

## Smith Booth Usher Co.

Los Angeles

2001 Santa Fe Ave. 228-238 Central Ave.  
BARBER-GREENE — Ditchers, Excavators, Loaders  
CEDAR RAPIDS—Crushing Plants  
EASTON—Industrial Cars  
FOUR WHEEL DRIVE—FWD Trucks  
FREEMAN—Turntables  
GALLON—Graders, Rollers  
HERCULES—Power Units  
JAEGER — Mixers, Hoists, Pumps, Tower Equipment  
JOHNSON—Bins, Hoppers  
LAKEWOOD—Road Finishers, Forms, Chuting, etc.  
CLEVELAND Crawler Tractors

MACWHYTE—Wire Rope  
MOHAWK—Asphalt Heaters  
MULTIFOOTE—Pavers  
MUNDY—Hoists  
SAUERMAN—Cableway Excavators, Power Drag Scrapers  
SCHRAMM—Compressors  
SIMPLEX—Trench Braces  
SKILSAW—Portable Electric Saws  
THEW—Shovels and Cranes  
UNION IRON WORKS—Pile Driving Hammers  
UNIVERSAL—"33" Shovels and Cranes

Member: Associated Equipment Distributors

## JENISON MACHINERY CO.

20th & Tennessee Sts., San Francisco

### Representing

Barber-Greene Co.  
Barnes Road Pumps  
Berg Finishers  
Butler Bin Co.  
Carter Hauling Pumps  
Chicago Pump Co.  
Cleaveland Tractor Co.  
Continental Motors Corp.  
Galion Iron Wks. & Mfg. Co.  
Hercules Products Co.

Loadmaster Cranes  
Morris Machine Works  
Orton Crane & Shovel Co.  
Rosen Mfg. Co.  
Saurman Bros., Inc.  
Smith Engr. Works  
Sterling Pump Works  
Superior Engine Co.  
Willitt Mfg. Co.  
Wolf Timber Saws

Member: Associated Equipment Distributors

## CROOK COMPANY

2900 Santa Fe Ave. Los Angeles, Cal.

### Southern California Distributors

Allis-Chalmers — Tractors  
Davis Mfg. Co. — Hydraulic Scraper  
Brenneis Co. — Scarifiers, Road Rippers, Implements  
Osgood Co. — Shovels, Cranes, Hoes  
Buffalo-Springfield Co. — Rollers  
Hetzl Steel & Iron Co. — Bins, Batches, Road Forms  
New Engine Co. — Engines, Hoists, Pumps  
Morton — Scrapers, Dirt Movers  
Sullivan Machinery Co. — Air Compressors  
Mask Woodridge Co. — Backfillers, Bulldozers  
D-A — Lubricants

## WE WOULD LIKE TO HAVE YOU HELP US

make this Directory of Dealers in construction equipment the most complete and accurate of its kind. Therefore, we would greatly appreciate any suggestions or corrections that you may have to offer.

## CONTRACTORS AND ENGINEERS MONTHLY

470 Fourth Avenue New York

## KRATZ & McCLELLAND, Inc.

522 Bryant St. San Francisco, Calif.  
Northern California Distributors

Ransome Concrete Machy. Co.—Pavers, Mixers, Towers, Chuting  
New Engine Co.—Engines, Hoists, Pumps, Lighting Units  
Chaussee Oil Burner Co.—Portable Asphalt Plants, Kettles, Surface Heaters  
Grayhound—Contractors Portable Saws  
Milwaukee Locomotive Co.—Gasoline Locomotives  
Speeder Machy. Corp.—Shovels, Cranes, Draglines  
Hetzl Steel Form & Iron Co.—Bins, Batches & Road Forms  
Ames Iron Works—Gasoline Road Rollers  
Union Iron Works, Inc.—Pile Hammers & Foundation Equip.  
Autonix, Inc.—Motor Truck Concrete Mixers  
Graham Ditcher Co.—Ditchers and Trench Supporters  
Fisher & Hayes Rope & Steel Co.—Concrete Form Devices  
H. P. Nelson Iron Works—Loaders & Conveying Equipment

## GARLINGHOUSE BROS.

2416 E. 16th Street, Los Angeles, Calif.

### Southern California Distributors for

BLAW-KNOX & WESTERN PIPE CORP.—Road Building Equipment, Steel Forms, Ord Road Finishers, Indus. Equipment, Steel Grating, etc.  
BROWNING CRANE & SHOVEL CO.—Shovels, Cranes  
DOMESTIC PUMP & PUMP CO.—Road Builders & De-watering Pumps  
RANSOME CONCRETE MACHY. CO.—Cone, Placing Eq., Concr. Mixers, Pavers, Pous. Concr. Placers, Grouters  
A. LESCHEN & SONS ROPE CO.—Wire Rope  
McKiernan-Terry Corp.—Pile Hammers, Lambert-National Hoists, Cableways, Whirlies  
WORTHINGTON—Portable Compressors, Jackhammers, etc.  
WALL TOOL CO.—Concrete Surfaces  
DOBBIE—Derrick & Derrick Finishes

Member: Associated Equipment Distributors

## EDWARD R. BACON CO.

CONSTRUCTION EQUIPMENT

Folsom at 17th St. San Francisco  
Adams Graders  
Burch Stone Spreaders  
Byers Shovels and Cranes  
Cedar Rapids Crushers  
Cleveland Trenchers  
Dobbie Winches and Derricks  
Easton Industrial Cars  
Freeman Turntable  
Hercules Power Units  
Homelits Pumps  
Huber Rollers  
Jaeger Concrete Mixers  
Johnson Bins and Batches  
Lakewood Finishers

Lidgerwood Hoists  
Midwest Locomotives  
McKiernan-Terry Pile Ham-mers  
McCormick-Dawing Tractors  
M & M Wire Clamp Co.  
Mittl Feste Road Pavers  
Northern Conveyors  
Ohio Loco. Cranes and Trac-tor Dump Wagons  
Schramm Air Compressors  
Templeton Keely Jacks and Trench Braces  
Toledo Torches and Hoses  
Trackson Crawler Tractors

Member: Associated Equipment Distributors

## ELTON T. FAIR CO.

1611 Wazee St. Denver, Colo.

### Representing

J. D. Adams Co.  
Pioneer Gravel Equip. Mfg. Co.  
D-A Lubricant Co., Inc.  
Madsen Iron Wks.  
Davey Compressor Co.

## LOOK THIS DIRECTORY OVER CAREFULLY

If you find any errors while checking over this directory will you please advise us at once, because it is our desire to keep it accurate and up-to-date at all times.

## CONTRACTORS AND ENGINEERS MONTHLY

470 Fourth Avenue New York

## NORRIS K. DAVIS, INC.

400 Seventh St. San Francisco, Calif.

### Representing

LE ROI CO.—Gasoline Power Units  
MINNEAPOLIS STL. & MACHY. CO.—Twin City Engines  
ARCHER IRON WORKS—Concrete Placing Equipment  
DAVIS CO.—Mixers, Hoists, Motor Truck Concrete Transfer Systems, Ready-mix Concrete Plants  
DIAMOND IRON WORKS—Saw Mill, Rock Crushing, Screening, Conveyor and Transmission Machinery  
HANSON CLUTCH & MACHY. CO.—Excavators  
O. K. CLUTCH & MACHY. CO.—Hoists, Air Compressor  
KEYSTONE DRILLER CO.—Shovels, Skimmers, Pullecoops, Well Drilling Machy., Tools

INDUSTRIAL & CONSTRUCTION EQUIPMENT

U. S. National Bank Building, Denver, Colo.

P.H.M. Shovels, Cranes, Drag-  
lines, Trench Machines  
NORTHERN Portable and  
Stationary Conveyors  
PLYMOUTH Gasoline and  
Diesel Locomotives  
ARCHER Steel Tower & Con-  
crete Distributing Systems  
OWEN Clamshell Buckets

OHIO Locomotives Cranes  
ERIE Aggrgometer Plants  
McKiernan-TERRY Pile  
Hammers  
GRUENDLER Crushing and  
Screening Plants  
HIGHWAY 2-4-8 Wheel  
Trailers  
PAGE Dragline Buckets



# Hendrie & Bolthoff Mfg. & Supply Co.

Established 1861

1635 Seventeenth St. Denver, Colo.

## Representing

AMERICAN—Contractors Saw Tables  
AMERICAN—Hoists, Derricks and Steam Shovels  
BARBER ASPHALT CO.—Roofing and Asphalt Products  
BEEBE BROS.—Hand Winches  
MASTER & WONDER—Concrete Mixers  
CLIMAX—Gasoline Power Units  
GARDNER-DENVER—Pumps, Air Compressors and Drills  
GENERAL ELECTRIC—Motors and Appliances  
NOVO—Engines and Hoists  
ROEBLING—Rope and Wire  
SKILSAW CORP.—Skilaws  
UNIVERSAL—Crushers  
WYOMING—"Red Edge" Shovels

# THE HENRY H. MEYER CO.

110 S. Howard St., Baltimore, Md.  
628 Manney Building, Washington, D. C.

## Representing

Blaw-Knox Co.  
Boston & Lockport Block Co.  
Byers Machine Co.  
Philip Carey Co.  
Chausse Oil Burner Co.  
Clyde Iron Works Sales Co.  
Conner & Co., Inc.  
Domestic Engine & Pump Co.  
Dobbie Foundry & Machine Co.  
Duff-Norton Mfg. Co.  
Gallon Iron Wks. & Mfg. Co.  
A. B. Farquhar Co., Ltd.  
Harrington Co.  
Ingersoll-Rand Co.  
A. Leech & Sons Rope Co.  
Pierce Equip. Co.  
Pulomometer Steam Pump Co.  
Ransome Concrete Machy. Co.  
Richmond Screw Anchor Co.  
Sterling Wheelbarrow Co.  
Templeton-Kenly Co., Ltd.  
Union Iron Works  
Universal Road Machy. Co.  
A. B. Farquhar Co., Ltd.

Member: Associated Equipment Distributors

# McDONALD TRACTOR EQUIP. CO.

2303 N. Orange Ave. Orlando, Fla.

## Representing

Caterpillar Tractor Co.  
"Caterpillar" Graders  
Athey Truss Wheel Co.  
Barnes Manufacturing Co.  
Blaw-Knox Company  
P & H Cranes  
LaPlante-Choate Mfg. Co.  
Detroit Harvester Co.  
Chain Belt Co.  
Fate-Rock-Heath Co.  
Fuller & Johnson Mfg. Co.  
Killefer Manufacturing Corp.  
Le Roi Company  
Goulds Pumps, Inc.  
Stover Engines  
Century Motors

# HERBERT N. STEINBARGER CO.

Construction Equipment

1640-1646 Wazee St. Denver, Colo.

## Distributors

BUCHYRUS-ERIE Steam, Gas, Diesel and Electric Shovels  
Draglines and Cranes  
VULCAN Steam and Gasoline Locomotives  
DIAMOND Crushing, Screening Plants  
ERIE Chambliss Buckets, Bins, Weighers  
SAUERMAN Power Scrapers, Cableway Excavators  
AUSTIN Trenching Machines, Backfillers  
STERLING Hoists, Pumps  
KNICKERBOCKER Concrete Mixers  
MULTI-FOOTE Paving Mixers  
BUFFALO-SPRINGFIELD Road Rollers  
BUHL Portable Compressors  
HARDSOGG Drills and Pavement Breakers

# JULIEN P. BENJAMIN, Inc.

21 N. Ocean St. Jacksonville, Fla.

## Representing

McKiernan-Terry Corp.  
Harber-Greene Co.  
Aeroll Burner Co.  
Sauerman Bros., Inc.  
Heltzel Steel Roll & Iron Co.  
Standard Conveyor Co.  
National Colortype Co.  
Huber Rollers  
Lambert-National Hoisting Engines  
Owens Buckets  
Resco Distributors  
Schramm Compressors  
Lewis-Shepard Company  
Steele & Condit  
Link-Belt Cranes  
Reme Graders

# YANCEY TRACTOR COMPANY

109-113 Becker Ave. Albany, Ga.

## Representing

"CATERPILLAR" Tractors  
and Road Machinery  
ATHEY Truss Wheels  
BAKER-MANEY Wheelers  
WATSON Dump Wagons  
KILLER Road Rippers  
Rotary Scrapers  
"RED EDGE" Shovels, Pick  
"RED STAR" Carts and  
Wheelbarrows  
EASTON Cars and Trucks  
MUNDY Hoists  
BARNES Pumps  
BUFFALO-SPRINGFIELD  
Rollers  
LITTLEFORD BROS. Asphalt  
Heater  
BARBER-GREENE Loaders  
Excavators and Compres  
BLAW-KNOX Turntable  
Steel Forms, Bins and S  
pers, Buckets, etc.  
HYVASS Flashers, Swaps  
HERCULES & LE ROI In  
gines  
INGERSOLL-RAND Com  
pressors  
ORD Conc. Road Surfac  
McKIERNAN-TERRY Fl  
Hammers  
P. & H. Shovels, Cranes  
REX Conc. Mixers, Pave  
LAPLANT-CHOATE Dump  
Wagons

# The K. B. NOBLE CO.

**C O N N E C T I C U T**

**REPRESENTING AMONG OTHERS**

GALION Gasoline  
Rollers, Road Grad  
ers, Scarifiers  
HELTZEL Bins and  
Batches  
LAWRENCE Pumps  
SULLIVAN Compre  
sors  
LIDGERWOOD MFG.  
CO.  
CHICAGO AUTOMATIC CONVEYOR CO.

SASGEN Derricks  
BYERS Shovels,  
Cranes, etc.  
LEROI Engines  
SMITH Crushers,  
Sand and Gravel  
Washing Plants  
OWEN Buckets  
SAUERMAN Dralines  
STERLING MACHY.  
CORP.—Pumps

Member:  
Associated Equipment Distributors

HARTFORD, CONNECTICUT

# FARQUHAR MACHINERY CO.

Mill Supplies and Machinery  
720 W. Bay Street Jacksonville, Fla.

## Representing

AMERICAN  
CARBIC  
CRESCENT  
FARQUHAR  
GOULDS-MYERS  
JACKSON  
LINK-BELT  
NOVO  
NOVO  
NOVO  
PLYMOUTH CORDAGE CO. Rope and Twine  
SASGEN  
SILVERSTRAND  
TOLEDO  
STRUCTURAL STEEL  
Full Line of Industrial Supplies

# R. S. ARMSTRONG & BRO. CO.

676 Marietta St. Atlanta, Ga.

ALLIS-CHALMERS Tractors  
AMERICAN Shovels, Scoops  
BEEBE Hand Hoists  
BUTLER Bins  
CARBIC Lights  
CHICAGO PNEUMATIC  
Air Compressors  
CONTINENTAL Motors  
DOMESTIC Pumps  
EDWARDS Shears  
EMERSON Pumps, Valves  
GALION Road Machinery  
GENERAL ELECTRIC  
Motors  
HERCULES Motors  
Member: Associated Equipment Distributors

# THE GESNER EQUIPMENT CORP.

254 Park St. New Haven, Conn.

## Representing

Jaeger Machine Co.  
Northern Conveyor & Mfg. Co.  
De Walt Products Co.  
Schramm, Inc.  
Cleveland Rock Drill Co.  
Marion Steam Shovel Co.  
Lakewood Eng. Co.  
Economy Steels and Bits  
Complete Rental Stocks

# M. D. MOODY

ACL No. 2—Sect. 1, Riverside Viaduct  
Jacksonville, Florida

## Representing

J. D. Adams & Co.  
American Casting Co.  
American Mfg. Co.  
American Tar Products Co.  
Buffalo-Springfield Roller Co.  
Cyclone Fence Co.  
The Elgin Corporation  
E. D. Emyre & Co.  
De Walt Products Co.  
Chas. Hyvass Co.  
Littleford Brothers  
Lakewood Engineering Co.  
Mead-Morrison Mfg. Co.  
Rawls Mfg. Co.  
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470 Fourth Ave. New York



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Kettles  
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Allis-Chalmers Tractors

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Forms, etc.

NOVO—Caroline Engines, Hoists, Pumps, etc.

WORTHINGTON—Air Compressors, Rock Drills, Paving

Breakers, etc.

GENERAL—Excavators and Shovels

JAEGER—Truck Concrete Mixers

KILLEFER—Road Rippers and Rooters, Road Dies, Scrap-

ers, Etc.

SUPERIOR—Weighing Batches

NORTHERN—Conveyors, etc.

JONES-SUPERIOR—Portable Saw Tables, etc.

COLUMBUS—Elevators and Conveyors

**SYRACUSE SUPPLY CO.**

314 W. Fayette St.

Syracuse, N. Y.

INGERSOLL RAND CO.—Compressors, Drills, Paving

Breakers

NATIONAL EQUIP. CO.—Pavers, Power Shovels, Ditchers,

Dumpers, Backfillers, Mud Jacks, Mixers

CATERPILLAR TRACTOR CO.—Tractors, Road Graders

LA PLANT-CHOATE CO.—Hydraulic Bulldozers, Plows,

Crawler Wagons

ATHEY TRUSS WHEEL CO.—Crawler Wagons

KILLEFER CO.—Road Rippers, Scrapers

BARNES MFG. CO.—Road and Drainage Pumps

WILLIAMSPORT WIRE ROPE CO.—Wire Rope

HAZARD WIRE ROPE CO.—Preformed Wire Rope

W. R. MEADOWS, INC.—Expansion Joint

CLYDE MFG. CO.—Hoists and Derricks

INSLEY MFG. CO.—Power Shovels, Concrete Placing

Equipment

Member: Associated Equipment Distributors

**CAROLINA TRACTOR & EQUIPMENT COMPANY**

17th &amp; Lee Streets

Salisbury, N. C.

*Representing**"Caterpillar"* Tractors and Graders*"Euclid"* Self-Loading Scrapers*"LaPlant-Choate"* Bulldozers*"Wonder"* & *"Marsh-Capron"* Mixers

and Hoists

*"Day"* Crushers**THE QUEEN CITY SUPPLY CO.**

Pearl &amp; Elm Sta.

Cincinnati, Ohio

*Representing*

Beebe Bros.—All-steel Hand Hoists

Chain Belt Co.—Mixers, Pumps and Pavers

Ingersoll-Rand Co.—Compressors, Pneumatic Tools

Sauerman Bros. Inc.—Cableway and Power Scraper Ex-

cavators

Clyde Iron Works—Hoisting Engines and Derricks

Williams—Buckets and Trailers

American Tubular Elevator Co.—Tubular Elevators

Wyoming Shovel Co.—"Red Edge" Shovels and Picks

Sagen Derrick Co.—Derricks

*Cincinnati's Largest Equipment House*

Member: Associated Equipment Distributors

**ENGELS TRACTOR CO. INC.**

Warehouse

334-336 N. Genesee St.,

Utica

New York

*Distributors**"P & H"* Shovels and Equipment*"ALLIS-CHALMERS"* Tractors*"F. W. D."* Four Wheel Drive Trucks*"PIONEER"* Crushing-Washing Equip-

ment

and other leading accounts

Phones 28361, 22312

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make this Directory of Dealers in construction equipment the most complete and accurate of its kind. Therefore, we would greatly appreciate any suggestions or corrections that you may have to offer.

CONTRACTORS AND ENGINEERS MONTHLY

470 Fourth Ave.

New York

**THE CLETRAC OHIO SALES CO.**

East 193rd St. &amp; Euclid Ave.

Cleveland

Ohio

*Representing*

The Cleveland Tractor Co.

The Essex Engine &amp; Mach. Corp.

The Tractor Equipment Co.

The Davey Compressor Co.

The Killefer Mfg. Corp., Ltd.

The Cleveland Rock Drill Co.

Phones: Kenmore 0300-3697

**McQuade & Bannigan, Inc.**

829 Noyes St.

Utica, N. Y.

*Representing*

Jaeger Machine Co.

Homelite Corp.

Ingersoll-Rand Co.

Cleveland Wheelbarrow Co.

**THE WM. T. JOHNSTON CO.***"Only Complete Equipment House in Cincinnati"*

210-212-214 Vine St. Cincinnati, O.

Austin Machinery Corp.

Archer Iron Works

Beaumont Mfg. Co.

Binks Mfg. Co.

Cleveland Formgrader Co.

DeWalt Product Co.

Fischer &amp; Hayes Rope and

Steel Co.

Homelite Corp.

Huber Mfg. Co.

Humphreys Mfg. Co.

Knickerbocker Co.

Mall Tool Co.

N. P. Nelson Iron Works

Orr &amp; Sombower, Inc.

Omaha Drag Line Bucket

Oxwell Acetylene Co.

Republic Iron Works

Sterling Wheelbarrow Co.

Sagen Derrick Co.

Schramm, Inc.

Western-Wheeled Scraper Co.

Wood Shovel &amp; Tool Co.

Williamport Wire Rope Co.

Member: Associated Equipment Distributors

**THE CUYAHOGA EQUIPMENT CO.**

3805 Perkins Ave.

Cleveland, Ohio

*Representing*

McGORMICK-DEERING Industrial Tractors

W. A. RIDDELL Warco Power Graders

DETROIT Street Sweeper and Snow Brush

HUGHES-KENAW Roustabout Cranes

CLEVELAND Rock Drill Air Tools

DAVEY Air Cooled Compressors

COMPRESSOR Rental Service

TEACKSON Crawler Tractor, Hoists &amp; Shovels

BLAIR Hydraulic Diggers

WARCO Semi Crawlers

BAY CITY Shovels

BOTARY Scrapers

Grader Blades, Scarifiers, Road Drags, Iron

Moles, General Planetainers, Lead Clay Cul-

vert Pipe

Phone Endicott 1800

**American Hardware & Equipment Co.**

CHARLOTTE

NO. CAROLINA

*Representing*

Hotchkiss Steel Products Co.

Jaeger Machine Co.

Nevo Engine Co.

Koppel Industrial Car &amp; Equip. Co.

Fruehauf Trailer Company

Burton Explosives Inc.

Independent Pneumatic Tool Co.

**H. P. KELLY EQUIPMENT CO.**

CINCINNATI, OHIO

4110 Langland St.

Kirby 2597

*Representing*

FOOTE CO.—Multi-Foot Pavers

GALION IRON WORKS—Road Rollers and Scrapers

HARNISCHFEGGER CORP.—P &amp; H Shovels, Cranes, Hoes,

Draglines and Trenchers

OWEN BUCKET CO.—Clamshell Buckets

BARNES MFG. CO.—Pumps

HELTZEL STEEL FORM CO.—Road, Curb and Gutter

Forms, Bins and Batches

FLEXIBLE ROAD JOINT CO.—Flexplane and Cleft Plane

BROWN HOIST CO.—Hoisting Engines

MILWAUKEE CRANE &amp; HOIST CO.—Hoist Cranes and

Derricks

SIGNAL SERVICE CORP.—Traffic Signs and Electrical

Devices

COLUMBUS CONVEYOR CO.—Belt and Bucket Conveyors

**WE WOULD LIKE TO HAVE YOU HELP US**

make this Directory of Dealers in construction equipment the most complete and accurate of its kind. Therefore, we would greatly appreciate any suggestions or corrections that you may have to offer.

CONTRACTORS AND ENGINEERS MONTHLY

470 Fourth Ave.

New York

# THE DAY & MADDOCK CO.

## Contractors' Equipment

8201 Almira Ave. Cleveland, O.

### Representing

Continental Motors Corp. Geo. Haiss Mfg. Co.  
Amar-Terry Derrick Co. Concrete Surf. Machy. Co.  
Knickerbocker Co. Universal Crusher Co.  
Blaw-Knox Co. Sauerman Bros. Inc.  
Remmel Manufacturing Co. Barnes Mfg. Co.  
Sterling Wheelbarrow Co. Sullivan Machinery Co.  
American Hoist & Derrick Co. Wappat, Inc.  
W. Toepfer & Sons Sewhill Mfg. Co.  
The Cleveland Formgrader Co.

# LOOK THIS DIRECTORY OVER CAREFULLY

If you find any errors while checking over this directory will you please advise us at once, because it is our desire to keep it accurate and up-to-date at all times.

## CONTRACTORS AND ENGINEERS MONTHLY

470 Fourth Avenue New York

# THE POPE EQUIPMENT CO.

Kent Pope, Pres.

4111 Euclid Ave. Cleveland, Ohio

## Transportation Engineers

Klauser Manufacturing Co., Sno-Glo  
Pope Salt Spreader and Ice Melter  
Traffic Signals, etc.  
Rebuilt Trailers of All Kinds  
Municipal Equipment  
Storage

# SMITH & ELLIOTT, INC.

644 North 4th St., Columbus, Ohio

## Representing

THE LE BLOND-SCHACHT TRUCK CO.—Motor Trucks  
SPEEDER MACHINERY CORP.—Shovels, Cranes and Draglines  
METALWELD INCORPORATED—Air Compressors  
CLEVELAND ROCK DRILL CO.—Rock Drills, Paving Breakers and Drill Steels  
HOMELITE CORPORATION—Portable Centrifugal Pumps, Lighting Plants and Blowers

# J. FRANK ROLLINGS

"The Crane Man"

2215 West Boulevard, Cleveland, Ohio

## Representing

THE OHIO POWER SHOVEL CO.  
Shovels, Cranes, Drag Lines

THE OWEN BUCKET CO.  
Clam Shell Buckets

REX Concrete Mixers

SCHRAMM Air Compressors

Telephone—Evergreen 3359

# C. L. STITH COMPANY

305 Franklin Bldg. Columbus, Ohio

## Representing

FOOTE CO.—Paving Mixers  
HELTZEL STEEL FORM & IRON CO.—Forms, Batching Plants  
HUBER MFG. CO.—Gasoline Rollers  
JAEGER MACHINE CO.—Concrete Mixers, Pumps, Hoists  
LAKEWOOD ENGINEERING CO.—Paving, Building and Industrial Equipment  
FLEXIBLE ROAD JOINT MACHINE CO.—Compressed Joint Machine  
LITTLEFORD BROS.—Tar and Asphalt Kettles  
CLEVELAND ROCK DRILL CO.—Rock Drills, Paving Breakers  
McCLOSKEY TORCH CO.—Bombshell Torches  
OWEN BUCKET CO.—Clamshell Buckets  
SASGEN DERRICK CO.—Derricks, Winches

# Industrial Engine Parts, Inc.

1053 E. 61st St. Cleveland, Ohio

## Representing

Minneapolis-Moline Power Impl. Co.  
Climax Engineering Co. Twin Disc Clutch Co.  
Fuller & Johnson Mfg. Co.  
Northern Conveyor & Mfg. Co.  
Stover Engine & Mfg. Co.  
Scintilla Magnetic Co.  
Wico Electric Co. Pierce-Governor Co.  
Portable Power Tool Corp. Hercules Prod. Co.  
Le Roi Co.  
Vulcan S-H-R Valves  
Bonney "CV" Wrenches  
Hastings "Dubl-test" Rings

# W. T. WALSH EQUIPMENT CO.

12500 Berea Road Cleveland, Ohio

## Representing

BYERS MACHINE CO.—Cranes and Shovels  
BUTLER BIN CO.—Bins and Batches  
"CATERPILLAR" Tractors  
GARDNER-DENVER CO.—Compressors and Air Tools  
"GYRO-CENTRIC" Crusher  
HUBER MFG. CO.—Road Rollers  
JAEGER-LAKEWOOD Equipment  
McKIERNAN-TERRY CORP.—File Hammers  
LAMBERT-NATIONAL DIV.—Hoisting Engines  
PIERCE EQUIPMENT CO.—Pierce "Bear" Rollers  
ROSCO MFG. CO.—Rosco Distributor, Oilier  
WELLMAN ENGINEERING CO.—Williams Buckets  
WHITE MFG. CO.—Chaume-White Asphalt Plants, Heaters  
Tel.: Lakewood 1024

# THE TAYLOR TRACTOR CO.

285 Cozzens St. Columbus, Ohio

## Representing

Caterpillar Tractor Company—Tractors, Road Machinery and Harvesters  
Harnischfeger Sales Corp.  
LaPlant-Chicago Mfg. Co.  
Novo Engine Co.  
Athey Truss Wheel Co.  
Killefer Manufacturing Corp.  
Baker Manufacturing Co.  
Euclid Road Machinery Co.  
Willamette-Ersted Co.  
Blaw-Knox Co. (Ateco Div.)  
All Steel Products Mfg. Co.

# INTERSTATE EQUIPMENT SALES CORPORATION

Chester-Twelfth Bldg., Cleveland, O.

## Representing

MANITOWOC ENGINEERING WORKS—Speedcranes, Shovels, Draglines, Trenches

MID-WEST Gas, Gas-Electric and Diesel-Electric Locomotives

OHIO Locomotive Cranes

JOS. F. KIESLER—Clam Shell Buckets

# McNEILLY MACHINERY CO.

337 South High St. Columbus, Ohio

## Representing

Austin Machinery Corp.—Trenching Machines, Backfillers, Shovels and Cranes  
Link Belt Co.  
Electric, Gasoline Cranes, Shovels and Draglines  
Blystone Mfg. Co.  
Concrete, Mortar and Plaster Mixers  
Doherty Fdy. & Mach. Co.  
Derricks and Flings  
Owen Bucket Co.—Clamshell and Digging Buckets  
Morstrench Corp.—Wellpoint Systems, Pumps  
McKiernan-Terry Corp.  
Pile Hammers, Lambert-National Hoisting Engines  
Sasgen Derrick Co.  
Derricks, Winches, etc.  
Barnes Mfg. Co.  
Pumps  
Chain Belt Co.  
REX Mixers and Pavers  
Gardner-Denver Co.  
Air Compressors, Tools  
Continental Rubber Works—Air Hose, Suction Hose

# THE W. W. WILLIAMS CO.

835 West Goodale St. Columbus, Ohio

Dayton

Cincinnati

## Representing

The Koehring Company  
Insley Manufacturing Co.  
T. L. Smith Co.  
Parsons Co.  
Cleaveland Rock Drill Co.  
The Sterling Motor Truck Co.  
Hug Company  
A. W. French & Co.  
Blaw-Knox Co.  
Blow Mfg. Co.  
Iowa Mfg. Co.  
McCormick-Deering Industrial Tractors  
The Buhl Co.

# THE W. M. PATTISON SUPPLY CO.

777 Rockwell Ave. Cleveland, Ohio

## Representing

Domestic Eng. & Pump Co.—Diaphragm and Force Pumps  
Homelite Corp.—Portable Pumps, Generators and Blowers  
Jaeger Machine Co.—Concrete Mixers and Towers  
Littleford Bros.—Asphalt Heaters, Tools and Oil Burners  
Orr & Sombower, Inc.—Electric and Gasoline Hoists, Boilers  
Patent Scaffolding Co.—Scaffold Equipment  
Sasgen Derrick Co.—Derricks, Winches  
Gustav Schaefer Co.—Automatic Fresnoe  
Wall Rope Works—High-Grade Manila Rope  
Wickwire-Spencer Steel Co.—Wire Rope  
Worthington Pump & Machy. Corp.—Compressors, Pumps  
Bebe Bros.—Hand Hoists, Wrecker Cranes, Electric Jig Saws  
Member: Associated Equipment Distributors

# The Osborne & Sexton Machy. Co.

Construction Machinery Division

Columbus Ohio

## Representing

ARCHER IRON WORKS—Material Towers  
BAY CITY SHOVELS, INC.—Gas Shovels  
BEEBE BROS.—Contractors' All-Steel Hand Hoists  
CLEVELAND ROCK DRILL CO.—Pneumatic Drills, Paving Breakers, etc.  
DOMESTIC ENGINE & PUMP CO.—Pumps, Hoisting Equipment  
ECONOMY ROCK BIT CORP.—Detachable Bits  
JONES SUPERIOR CO.—Gasoline Saws  
SCHRAMM, INC.—Air Compressors  
UNION IRON WORKS—Pile Driving Equip.  
Rentals—Sales—Service

# Ohio Valley Machinery Co.

Marietta Ohio

## Representing

International Harvester Co.  
Trackson Co.  
Wehr Co.  
Hughes-Keenan Co.  
Schramm, Inc.  
Bay City Shovels, Inc.  
W. M. Blair Mfg. Co.  
Brookville Locomotive Co.  
Muskegon Iron Works  
Corley Mfg. Co.  
Detroit Harvester Co.  
Domestic Engine & Pump Co.  
Chain Belt Co.



**W. A. KUHLMAN & CO.**

Contractors' Equipment

1804-6 Dorr Street Toledo, Ohio

## Representing

Barnes Mfg. Co.  
 Bay City Shovel Inc.  
 Beach Mfg. Co.  
 Clyde Iron Works Sales Co.  
 Concrete Surf. Machy. Co.  
 Lakewood Engineering Co.  
 A. Leach & Sons Rope Co.  
 Littleford Bros.  
 Construction Machy. Co.

Erie Steel Construction Co.  
 Sagen Derrick Co.  
 Smith Engineering Works  
 Sterling Wheelbarrow Co.  
 Sullivan Machinery Co.  
 Jos. F. Kresler Co.  
 W. A. K. Column Clamps  
 Bates Mfg. Co.

**BUNTING TRACTOR COMPANY**  
LA GRANDE, OREGON

## Representing

Caterpillar Tractor Company  
 "Caterpillar" Tractors  
 "Caterpillar" Combines  
 "Caterpillar" Road Machinery  
 Athey Truss Wheel Company  
 LaPlant-Choate Mfg. Company  
 American Tractor Equipment Co.  
 Killefer Manufacturing Company  
 Willamette-Ersted Company  
 Williamsport Wire Rope Company

**MITCHELL, LEWIS & STAVEL CO.**  
330 E. Morrison St. Portland, Ore.

## Representing

ANTHONY CO.—Hydraulic Dump Bodies  
 SOLANO IRON WORKS—"Pacific" Revolving Tractor Scrapers, Fresno Scrapers  
 THE NEW WAY MOTOR CO.—Air-Cooled Engines  
 STOVER MFG. & ENGINE CO.—Gasoline Engines  
 THE F. E. MYERS & BROTHER CO.—Power Pumps

**J. WALKER WILSON**

Contractors' Machinery

P. O. Box 33

YOUNGSTOWN OHIO

## Representing

KEYSTONE DRILLER CO.  
 E. J. McHARG & CO.  
 SULLIVAN MACHINERY CO.  
 THE BARNES MFG. CO.  
 Keystone Excavators  
 MultiFoot Road Pavers  
 Sullivan Portable Compressors and Tools  
 Barnes Pumps  
 Blaw-Knox Buckets, Forms, etc.

Telephone 3-5766

**BALZER MACHINERY COMPANY**

275 Pine Street Portland, Ore.

## Representing

Marion Steam Shovel Co.—Large Power Shovels  
 Ohio Locomotive Crane Co.—Locomotive Cranes  
 Gardner-Denver Co.—Air Compressors, Drills, etc.  
 Wheeling Mold & Foundry Co.—Jaw Rock Crushers  
 Byers Machine Co.—Small Power Shovels  
 Niagara Concrete Mixer Co.—Vibrating Screens  
 Superior Engine Co.—Diesel Engines  
 S. D. LeClair Co.—Dragline Buckets  
 Chicago Automatic Conveyor Co.—Conveyors, Loaders, etc.  
 J. S. Mundy Hoisting Engine Co.—Steam, Gas and Electric Hoists  
 Ohio Tractor Dump Wagons

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**CONTRACTORS AND ENGINEERS MONTHLY**

470 Fourth Ave. New York

**THE BOARDMAN CO.**

Oklahoma City Oklahoma

## Representing

ALLIS-CHALMERS MFG. CO.  
 Crawler and Wheel Type Tractors with Allied Equipment

ARMCO CULVERT MFRS. ASSN.  
 Armco Ingot Iron Culverts

KILLEFER MFG. CORP.  
 Dirt Moving Tools

**CLYDE EQUIPMENT CO.**Contractors' Equipment and Supplies  
Portland, Oregon Seattle, Wash.

Atlas Imperial Diesel Eng. Co.  
 Clyde Iron Works  
 Homelite Corp.  
 Jaeger Machine Co.  
 Lincoln Electric Co.  
 Bucyrus-Erie Co.  
 Geo. Hales Mfg. Co., Inc.  
 Sauerman Brothers  
 Lakewood Engineering Co.  
 Sterling Wheelbarrow Co.  
 Sullivan Machinery Co.  
 Traylor Engr. & Mfg. Co.  
 McKiernan-Terry Corp.  
 Klauer Mfg. Co.  
 Foote Company, Inc.  
 Allis-Chalmers Mfg. Co.  
 Le Roi Co.  
 Iowa Mfg. Co.  
 Beebe Bros.

Member: Associated Equipment Distributors

**Western Road Machinery Co.**

220-222 E. Water St. Portland, Ore.

## Representing

SMITH ENGINEERING WORKS—Telsmith Crushers  
 MADSEN IRON WORKS—Portable Asphalt Paving Plants  
 WORTHINGTON PUMP & MACHINERY CORP.—Worthington Compressors, Worthington-Gillman Air Tools  
 OHIO POWER SHOVEL CO.—LIMA 1 & 1 1/4 yd. Shovel  
 HUBER MFG. CO.—Road Rollers  
 J. D. ADAMS CO.—Adjustable Leaning Wheel Graders  
 HIGHWAY—Heavy-Duty Machinery Trailers  
 MUNICIPAL SUPPLY CO.—Oil Distributors  
 GENERAL EXCAVATOR CO.—General Half Yard Shovel  
 NOVO ENGINE CO.—Engines, Hoists and Pumps

Member: Associated Equipment Distributors

**Leland Equipment Company**

Tulsa and Oklahoma City, Oklahoma

## Distributors for

NATIONAL EQUIPMENT CORP.—Concrete Mixers, Pavers  
 Excavators, Cranes, Trenching Machines and Back-Fillers  
 INSBLEY MFG. CO.—Shovels, Cranes, Backhoes, Concrete Chuting, Towers and Buckets  
 BLAW-KNOX CO.—Bins, Forms, Buckets  
 IOWA MFG. CO.—Rock Crushing Plants  
 SCHRAMM, INC.—Air Compressors, Pneumatic Tools  
 McCLOSKEY—Torches  
 McKiernan-Terry Corp.—File Hammers, Steam, Electric and Gasoline Hoists  
 C. H. & E. MFG. CO.—Portable Saw Rigs, Hoists and Pumps, Conveyors Loaders, Wheelbarrows, Tar Kettles

COMPLETE LINE OF TRUCK EQUIPMENT

**FEENAUGHTY MACHINERY CO.**320-338 Belmont St. Portland, Ore.  
Spokane — Seattle — Boise

## Representing

American Saw Mill Machinery Co.  
 Chicago Pneumatic Tool Co.  
 Construction Machy. Co.  
 Four Wheel Drive Auto Co.  
 Gallon Iron Works and Mfg. Co.  
 Foote Bros. Gear and Machine Co.  
 Littleford Bros.

Member: Associated Equipment Distributors

**G. M. STULL COMPANY**

Chester Pennsylvania

## Representing

Fordson Tractors  
 Universal Power Shovels  
 Road Machinery  
 Contractors' Supplies  
 Diamond Tires

"Equipment and Supplies for the Fordson"

**MILLER-SANFORD TRACTOR CO.**Eugene — Klamath Falls — Medford  
Roseburg  
OREGON

## Representing

Caterpillar Tractor Co.  
 Tractors — Graders — Harvesters  
 American Tractor Equipment Co.  
 Killefer Manufacturing Co.  
 Willamette-Ersted Co.  
 Euclid Road Machy. Co.  
 LaPlant-Choate Co.

**Howard-Cooper Corporation**

Portland — Seattle — Spokane — Twin Falls

## Representing

International Harvester Co.  
 (McCormick-Deering Industrial Tractors)  
 Austin Machinery Corp.  
 Barber-Greene Co.  
 Cleveland Rock Drill Co.  
 The Osgood Co. (Shovels)  
 Hughes-Kennan Co.  
 Leach Co.  
 Nordberg Mfg. Co. (Symons Crushers)  
 Orton Crane & Shovel Co.  
 Rotary Snow Plow Co.  
 Schramm, Inc. (Compressors)  
 Universal Power Shovel Co.  
 Buda Co. (Diesel & Gas Engines)  
 Baker Mfg. Co.  
 Walter Motor Truck Co.  
 Seagrave Corp.  
 Pacific Goodrich Rubber Co.

Member: Associated Equipment Distributors

**Any errors?**

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## Address

**CONTRACTORS AND ENGINEERS MONTHLY**

470 Fourth Avenue New York

# **BARNARD TRACTOR & EQUIPMENT CO., INC.**

825 Paxton Street, Harrisburg, Pa.

## *Representing*

BAKER—Maneys and Drags  
RUSSELL—Drags, Scoops  
DOMESTIC—Pumps  
HIGHWAY—Trailers  
MIAMI—Trailers, Scrapers  
W.K.M.—Pipe Handling Equipment  
DETROIT—Road and Street Brushes  
WILLIAMS—Clam Shell Buckets  
MILBURN—Carbide Lights, Paint Spray Out-fits

# **BOWEN MACHINERY CO.**

Excavating—Construction—Industrial EQUIPMENT

1126 N. Delaware Ave. Philadelphia, Pa.

## *Distributors for*

BYERS Shovels and Cranes  
McKIERNAN-TERREY Pile Hammers and Derricks  
LAMBERT-NATIONAL Hoists, Car Pullers, Cableways  
DAVEY Air Cooled Compressors  
WILLIAMS Clamshell Buckets, Heavy Duty Trailers  
TAYLOR-WHARTON Manganese Shovel and Bucket Teeth

# **DE HUFF AND HOPKINS**

261 N. Broad Street Philadelphia

## *Representing*

SPEEDER MACHINE CORPORATION  
3/4 yd., 1 1/2 yd. and 1 3/4 yd. full revolving Shovels & Cranes  
Motor Truck Cranes  
EASTON CAR CONSTRUCTION CO.  
Dump and Flat Cars for Construction Work  
Concrete Handling Dump Bodies  
Turntables—Portable—Track—Rails, etc.  
BROOKVILLE LOCOMOTIVE CO.  
Ford and McCormick-Deering Type Gasoline Locomotives  
MILWAUKEE LOCOMOTIVE MFG. CO.  
Gasoline Locomotives, 4 to 30 tons  
O. K. CLUTCH & MACHY. CO.  
Air Compressors & Hoisting Machinery  
Portable Belt Conveyors—Valves and Sluice Gates—Steel Plate Work

# **EDELEN & BOYER COMPANY**

Office and Warehouse Philadelphia  
236 N. 23rd St. Penna.

## *Distributors for*

Lima "101" Shovel, Crane & Trencher  
General Shovels, Cranes, Skimmer, Back Hoe  
Multi Foot Pavers  
Fley Hoists  
Freeman Turntables  
Hetzl Steel Road Forms  
Hetzl Sidewalk & Gutter Forms, Bins and Batches  
Sagen Derricks & Elevators  
Wunder Mixers and Pumps  
Miles Block Machines  
Pulsometer Steam Pumps  
CMC Gasoline Hoists  
Oimsteel Platform Trailers  
Hayward Clamshell Buckets  
Archer Concrete Towers and Chuting Plants  
Marsh-Capron Mixers  
Marie Mud and Water Pumps  
Bay City Truck Cranes  
Haise Loaders, Unloaders and Belt Conveyors  
True-Lay Steel Cable  
Reynolds Constr. Furnaces  
Jackson—Wheelbarrows, etc.

# **HARRY J. FERGUSON**

Complete Labor-Saving Material-Handling Equipment

626 Race Street, Philadelphia, Pa.

## *Representing*

SPROUT, WALDRON & CO., INC.—Material-handling Equip., Elevating & Conveying Machy., Bulk Cement Handling Equip.  
W. A. JONES FOUNDRY & MACHINE CO.—Spur-Herringbone and Worm Speed Reducer  
MOLINE MALLEABLE IRON CO.—Malleable Iron Chain and Sprockets  
CHICAGO AUTOMATIC CONVEYOR CO.—Portable Loaders, Unloaders, Portable Belt Conveyors

# **GILES & RANSOME**

17th St. & Sedgley Ave., Philadelphia

RANSOME CONCRETE MACHINERY CO.—Concrete Mixers and Appliances

BLAW-KNOX CO.—Clam-shell Buckets, Steel Forms, Steel Buildings, Steel Bins

CATERPILLAR TRACTOR CO.—Tractors and Road Machinery

RICHMOND SCREW ANCHOR CO.—Concrete Specialties

THE BARNES MFG. CO.—Centrifugal Diaphragm and Force Pumps

NORTHWEST ENGINEERING CO.—Gasoline Cranes and Shovels

ORD—Road Finishing Machine

CLYDE—Hoisting Engines and Derricks

GARDNER-DENVER—Compressors and Tools

TOLEDO WHEELBARROW CO.—Wheelbarrows

Member: Associated Equipment Distributors

# **LODER & SHARP, INC.**

"Everything for Roads"

32nd Street and Powelton Avenue PHILADELPHIA, PA.

## *Representing*

F. W. D. Trucks

BATES Tractors

ROME Graders

RELIANCE Crushers

HUBER Rollers

WHEELING Pipe

# **MAERKY MACHINE WORKS**

632 Race Street

Philadelphia

Penna.

## *Representing*

The Climax Engineering Co.

Twin Disc Clutch Co.

Modern Equipment Co.

# **HOWARD W. READ CORP.**

800 N. Delaware Ave., Philadelphia, Pa.

## *Distributors*

DOMESTIC ENGINE & PUMP CO.—Pumps

HAISS—Buckets

JONES SUPERIOR—Saw Rigs

LINK-BELT—Cranes and Shovels

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Sullivan Machinery Co.  
Sunbeam Mfg. Co.  
Templeton, Kenly Co.  
Kalamazoo Railway Supply Co.  
Williams Buckets & Trailers  
Williams-Ersted Co.  
Wyoming Shovel Works  
Young Iron Works

**JOS. S. POTTS, JR. COMPANY**

Factory Sales Engineers

Travelers Bldg. Richmond, Va.

Representing

Bacrus-Erie Co. Boston Woven Hose &  
McKiernan-Terry Corp. Rubber Co.  
Delster Concentrator Sprague Electric Hoists  
Co. Div.  
National Wire Cloth Co. Traylor Engrg. & Mfg.  
Williams Buckets and Co.  
Trailers

A. Leschen &amp; Sons Rope Co.

and other leading manufacturers

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**CONTRACTORS AND ENGINEERS  
MONTHLY**

470 Fourth Ave. New York

**GENERAL MACHINERY CO.**East 3500 Block Riverside Avenue  
Spokane Washington

Representing

Ohio Power Shovel Co.  
General Excavator Co.  
Bay City Shovels, Inc.  
Smith Engineering Works  
Jaeger Machine Co.  
Superior Engine Co.  
Hercules Motors Corp.  
DeLaval Steam Turbine Co.  
General Electric Co.  
John A. Roebbing's Sons' Co.  
Cleveland Wheelbarrow Co.  
Midwest Locomotive Works

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**CONTRACTORS AND ENGINEERS  
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**Southern Machinery & Supply Co.**

Roanoke Virginia

"All Kinds of Machinery"

Austin-Western Road Littleford Bros.  
Machinery Co. Cleveland Tractor Co.  
The Osgood Co. Linn Manufacturing  
Vulcan Iron Works Corp.  
Chain Belt Co. Gruender Crusher &  
The Novo Engine Co. Pulv. Co.  
Austin Machinery Corp. Columbus Conveyor  
George Hais Manufacturing Co.  
Heltzel Steel Form & Power Manufacturing  
Iron Co. Co.  
Gardner-Denver Co.

Contractors' Equipment in Stock in our  
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Farming Equipment

Representing

**CATERPILLAR TRACTOR CO.**  
Tractors — Graders — Harvesters

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7th &amp; Bainbridge Sts. Richmond, Va.

Representing

JAEGGER—Mixers, Hoists and Pumps  
WORTHINGTON—Air Compressors  
BROWNING—Cranes and Shovels  
CLEVELAND—Rock Drills  
HOMELITE—Portable Pumps  
OTCLORE—Road Guard  
LAKEWOOD—Towers and Paving Equipment  
SKILSAW—Electric Saws  
BEEBE—All Steel Hand Hoists

Complete Stock of Contractors' Supplies  
and Accessories**GEIJSBEEK ENGINEERING CO.**

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Representing

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FATE-FOOT-HEATH Crushers  
EAGLE Sand and Gravel Plants  
HARDINGE Grinding Mills  
NORTH AMERICAN REFRAC-  
TORIES CO.—Fire Brick  
Pumps, Compressors, Drilling Tools  
Contractors' Scientific Instruments

**Bluefield Supply Company**

Bluefield W. Va.

Representing

Blaw-Knox Co. Goodyear Rubber Co.  
Ingersoll-Rand Co. E. I. DuPont de Nemours & Co.  
National Equip. Corp. Williamsport Wire  
Novo Engine Co. Rope Co.  
Johns-Manville Corp. General Electric Co.  
Cleveland Tractor Co. American Saw Mill  
Machy. Co. Brookville Locomotive  
Co.  
A. B. Farquhar Co., Ltd.

Authorized Waukesha Service

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**CONTRACTORS AND ENGINEERS  
MONTHLY**

470 Fourth Ave. New York

**PACIFIC HOIST & DERRICK CO.**

Machinery and Equipment

3200 4th So. Seattle, Wash.

Representing

NORTHWEST—Gas and Electric Shovels,  
Cranes and Draglines  
BUHL—Air Compressors  
TWIN DISC—Clutches for all purposes  
PAGE—Scraper Buckets, Diesel Draglines  
MINNEAPOLIS—"Twin City" Gas Engines  
CLIMAX—Gasoline Engines  
WISCONSIN—Gasoline Engines  
MIDWEST—Locomotives  
DAKE ENGINE CO.  
PIONEER—Gravel Equipment  
ISAACSON IRON WORKS—Buckets  
Member: Associated Equipment Distributors

**GENERAL EQUIPMENT CO., Inc.**

414 No. Fourth St. Clarksburg, W. Va.

Representing

CATERPILLAR TRACTOR CO.—Tractors, Graders  
DETROIT HARVESTER CO.—Street Sweepers, Mowers  
KILLER MFG. CORP.—Plows and Discs  
HUBER MFG. CO.—Gasoline Rollers  
ATHEY TRUSS WHEEL CO.—Crawler Wagons  
GARDNER-DENVER CO.—Compressors and Jackhammers  
STERLING WHEELBARROW CO.—Wheelbarrows  
BLAW-KNOX CO.—Road Form, Hatchers, Bins, etc.  
LA PLANT-CHOATE MFG. CO.—Buildings Snow Plows  
AMERICAN CABLE CO.—Tr-Lay Rope  
BURCH CORP.—Conveyors, Car Unloaders and Spreaders  
NORTHWEST ENGINEERING CO.—Gasoline Shovels  
BARNES MFG. CO.—Pumps  
JAEGGER MACHINE CO.—Concrete Mixers  
HERCULES POWDER CO.—Explosives & Blasting Supplies  
EUCRID ROAD MACHY CO.—Earth Moving Equipment.  
DAY—Crushers  
PIONEER GRAVEL EQ. MFG. CO.—Gravel Loading Equip.

**BAILEY-TREEN MACHINERY CO.**

20th St. & B. & O. R. R. Huntington, W. Va.  
Caterpillar Tractor Co.  
Athey Truss Wheel Co.  
Allsteel Products Mfg. Co.  
LaPlant-Choate Mfg. Co.  
Northwest Engineering Co.  
Euclid Road Machinery Co.  
Detroit Harvester Co.  
Williamette-Ersted Co.  
Gardner-Denver Co.  
Huber Roller Co.  
W-K-M Co., Inc.  
Heltzel Steel Form & Iron Co.  
Universal Crusher Co.  
Burch Corp.  
Foots Co.  
American Tractor Equip. Co.  
Davy Compressor Co.

**BOEHCK EQUIPMENT COMPANY**

2404 W. Clybourn St., Milwaukee, Wis.

*Representing*

Barber-Green Company  
Byers Machine Company  
Jaeger Machine Company  
LeRoi-Rix Air Compressors  
A. Strelch & Brothers Co.  
Williams Buckets & Trailers  
Kerner Automatic Hoist Co.  
McKiernan-Terry Corp'n  
Huber Mfg. Company  
W. Toepfer & Sons Co.  
Symons Clamp & Mfg. Co.  
J. P. Curry Mfg. Company  
Jones Superior Machine Co.  
Sagen Derrick Company  
Aerol Burner Co., Inc.  
Fairbanks, Morse & Co., Inc.  
Universal Form Clamp Co.  
Moloch Foundry & Mach. Co.  
J. S. Mundy Hoisting Engine Co.

**ENGINEERS AND CONTRACTORS  
SUPPLY COMPANY**

West Allis

Wisconsin

*Representing*

Austin Machinery Corporation  
Browning Crane & Shovel Co.  
Rommel Concrete Mixer Co.  
Belmont Packing & Rubber Co.  
Whiting Leather & Belting Co.

Complete line of Concrete Product Equipment.  
Block, Brick and Tile Machines.

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*Contractors' Equipment*

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*Representing*

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Drake-Williams-Mount Co.  
Flexible Rd. Joint Machine Co.  
Heltzel Steel Form & Iron Co.  
Leach Company  
Manitowoc Engineering Works  
Mead-Morrison Mfg. Co.  
Schramm, Inc.  
Sterling Machinery Corp.

**HUNTER MACHINERY COMPANY**

327 So. 16th St.  
Milwaukee, Wis.

627 E. Mifflin St.  
Madison, Wis.

ARCHER Towers  
BATES Wire Ties  
BLAW-KNOX Bins, Forms  
CHAIN BELT Mixers, Pav-  
ers, Pumps, Truck Mixers,  
Saw Rigs  
CLYDE Hoists, Derricks  
HOMELITE Pumps  
LESCHEN Wire Rope  
NORTHWEST Shovels,  
Cranes  
ORD Finishing Machines  
PULSOMETER Steam Pumps  
ROSS Snow Plows  
SASGEN Derricks, Winches  
SAUERMAN Draglines, etc.  
SULLIVAN Compressors,  
Tools

"Caterpillar" Dealers for Southern Wisconsin  
Trackson Company  
Euclid Road Machy. Co.  
Blaw-Knox Atco Div.  
LaPlant-Choate Mfg. Co.  
Also Handle "Cat." Attach-  
ments, Wagons, Etc., Made  
by  
Member: Associated Equipment Distributors

**T. W. MEIKLEJOHN CO.**

520 No. Main St. Fond du Lac, Wis.

*Representing*

Speeder Machinery Corp.  
W. A. Riddell Co.  
Sauerman Bros., Inc.  
Wehr Co.  
Trackson Co.  
Williamette-Ersted Co.  
Fordson Distributor in Wisconsin,  
Illinois, Iowa, Indiana and Michigan

**CUNNINGHAM-ORTMAYER CO.**

429 W. Michigan St. Milwaukee, Wis.

*Distributors*

BUTLER—Bine and Measuring Devices  
CAREY—Elastic Joints and Building Materials  
C. H. & E. Pumps, Hoists and Saw Rigs  
CONCRETE ENGR. CO.—Reinforcing Steel  
DOWFLAKE—Calcium Chloride  
DAVENPORT—Sheepfoot Rollers and Snow Plows  
INGERSOLL-RAND—Compressor, Concr. Breakers, Diggers  
LAKEWOOD—Road Finishers, Subgraders, Chuting Equip.  
LITTLEFORD—Road and Street Maintenance Equipment  
KOEHRING—Shovels, Pavers, Dumpsters and Mud Jacks  
PARSONS—Ditchers and Trenchers  
SERVICE—Hand Shovels, Scoops and Spades  
SMITH, T. L.—Pavers and Mixers  
STERLING—Wheelbarrows  
TUFOTE—Waterproof Paper  
WEHR—Rollers, Power Graders  
WILLIAMS—Form Clamps and Accessories  
Member: Associated Equipment Distributors

**W. A. NELSON EQUIPMENT CO.**

534 No. 25th St. Milwaukee, Wis.

*Representing*

WORTHINGTON—Portable Air Compressors,  
Air Tools  
CONSTRUCTION MACHINERY CO.—Pumps,  
Hoists, Saw Rigs, Material Elevators  
NOVO—Engines, Pumps, Hoists  
STERLING—Wheelbarrows  
ERIE—Bins, Clamshell Buckets

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Thank you.

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MONTHLY**

470 Fourth Ave. New York

**DROTT TRACTOR CO., INC.**

3841 Wisconsin Avenue

Milwaukee Wisconsin

*Representing in the State of Wisconsin  
and Upper Peninsula of Michigan:*

ALLIS-CHALMERS — Industrial and Track Type  
Tractors, Power Operated  
Elevating and Blade Graders,  
Motor Patrol Graders,  
Track Type Wagons  
PIONEER—Gravel Equip.  
DROTT—Bulldozers & Scar-  
ifiers  
WAUSAU—Snow Plows  
TWO-WAY-DRIVE—Super  
Trucks  
DAVEY Air Compressors  
KINNEY Road Oilers  
TORO Highway Mowers  
HERCULES Road Rollers  
HIGHWAY Trailers  
CLEVELAND Rock Drills  
WILLETT Truck Blades  
HANDY SANDY Sand  
Spreaders  
SHAW ENOCHS Pull Type  
Graders

**ROBERT T. TWEDT CO., INC.**

15th St. and Pioneer Ave. Cheyenne, Wyo.

*Representing*

"CATERPILLAR" Tractors and Graders  
LaPLANT-CHOATE Snow Removal and Dirt  
Moving Equipment  
RILLEFER Scrapers, Fresnoe & Road Rippers  
ATHEY TRUSS Wheel Wagons  
EUCLID Road Machinery  
MACWHITE Wire Rope  
OIL FIELD Hoists and Equipment  
GOOD ROADS Champion Sand & Gravel Equip.  
WIARD Road Plows  
WAUSAU Bulldozers, Snow Plows and Soil  
Fillers  
SPEEDER Draglines and Shovels  
MASTER Loaders and Rotary Scrapers  
DETROIT Mowers, Sweepers & Snow Brushes  
WILLIAMS Buckets and Heavy Duty Trailers

**Three Lists Worth Consulting:**

Valuable Catalogs for Contractors . . . pages 50, 52 and 54  
Equipment Distributors' Directory . . . pages 58 to 77  
Engineers' Directory . . . pages 55 to 57

*If you don't find what you want in these lists, write us.*

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470 FOURTH AVENUE

NEW YORK



# CANADA

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British Columbia  
Manitoba  
Ontario  
Quebec  
Saskatchewan

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**CALGARY ALBERTA**  
Representing  
Northwest Engineering Co.  
Page Engineering Co.  
B. Greening Wire Co., Ltd.  
London Concrete Mchry. Co., Ltd.  
Iowa Mfg. Co.  
Herbert Morris Crane & Hoist Co. Ltd.  
Worthington Pump & Mchry. Corp.  
Templeton, Kenly & Co., Ltd.  
Federal Belting & Asbestos Co., Ltd.  
Moon Manufacturing Co.  
Factory Equipment Ltd.  
J. L. Goodhue & Co., Ltd.  
Jeffrey Manufacturing Co.  
Canadian Hoists & Conveyors, Ltd.  
Dominion Rd. Machy. Co., Ltd.

## BROWN, FRASER & CO. Ltd.

**Vancouver British Columbia, Can.**  
Representing  
BAY CITY Shovels and Cranes  
CASEY JONES Speeders  
CEDAR RAPIDS Gravels Plants, Crushers  
CLETRAC Tractors  
GALION Road Machinery  
KAISS Mechanical Loaders and Excavators  
HERCULES Engines and Power Units  
HUMDINGER Pumps  
PLYMOUTH Gas and Diesel Locomotives  
SAUERMAN Scrapers and Excavators

## MORRISON TRACTOR & EQUIPMENT CO. Ltd.

**940 Station St. Vancouver, B. C.**  
**BRITISH COLUMBIA DISTRIBUTORS FOR**  
Caterpillar Tractor Co.  
Tractors—Graders—Combines  
Pioneer Gravel Equipment Mfg. Co.  
American Tractor Equip. Co.  
LaPlant-Choate Mfg. Co.  
Athey Truss Wheel Co.  
Killefer Mfg. Corp.  
Rotary Snow Plow Co.  
Detroit Harvester Co.  
Day Pulverizer Co.

## WILLARD EQUIPMENT, LIMITED

**Vancouver, British Columbia, Canada**  
Municipal and Construction Supplies  
Representing  
SAWYER MASSEY, LTD.  
Hamilton Ont., Ed. Mchry.  
THE PEOLAR PEOPLE  
LIMITED, Ottawa, Ontario  
—Sheet Metal Products  
FRANCIS HANKIN & CO.  
Ltd.—Montreal, Quebec—  
Water Meters, Etc.  
RANSOMES SIMS & JEF-  
FERIES, Ltd.—Inverch,  
Eng.—Lawn Mowers  
DENNIS BROS. LTD., Guil-  
ford, Eng.—Lawn Mowers  
WOODALL - DUCKHAM  
VERTICAL RETORT &  
OVER CONSTRUCTION  
CO., LTD., London, Eng.—  
Vertical Retort Ovens  
WITTE ENGINE WORKS—  
Kansas City, Mo.—Gas-  
oline Saws, Pumps & Engines  
BUCYRUS-ERIE CO.—So.  
Milwaukee, Wis.—All types  
of Excavators  
CONSTRUCTION MACH-  
INERY CO.—Waterloo, Ia.  
Concrete Mixers, Hoists  
CANADIAN JOHNSON MO-  
TOR CO., Peterboro, On-  
tario—Motor Scythes and  
Johnson - Tremblay Fire  
Fighting Pumps

## KIPP-KELLY, Ltd.

**68 Higgins Ave. Winnipeg, Manitoba**  
Representing  
GARDNER-DENVER — Air  
Compressors, Tools  
KELLER Pneumatic Rivet-  
ers, Calkers, Drills  
LIDGERWOOD — Hoists,  
Derricks, Excavators, etc.  
ORENSTEIN & KOPPEL—  
All Types Industrial Cars  
PETTERS—Oil Engines and  
Generating Sets  
WHITCOMB—Gasoline, Oil,  
Electric Locomotives  
MORRIS — Cranes, Hoists,  
Blocks, Crane Trucks  
—REPAIR PARTS AND SERVICE SHOPS—  
S. K. F.—Drill Steel, Special  
Steels  
BUCYRUS-ERIE—P o w e r  
Shovels, Draglines, Exca-  
vators  
R. HOOD HAGGIE—Steel  
and Wire Cable  
STANDARD—Diamond  
Drills  
MEKIERNAN-TERRY—Pile  
Hammers, Core Drills  
MITCHELL Electric Vibrat-  
ing Screens

## LONDON CONCRETE MACHY. CO.

**LONDON CANADA**  
Limited  
Representing  
ARCHEER Tower Hoist Equipment  
BLACKMEE Pumps  
CONSOLIDATED Concrete Machinery  
FOOTE Pavers  
NOVO Gasoline Engines  
Concrete Mixers—Tilting and Non-  
Tilting  
Concrete Block Machines  
Cement Brick Machines  
Hoisting Engines  
Centrifugal, Diaphragm and Rotary  
Pumps  
EVERYTHING FOR THE CONTRACTOR

## CANADIAN EQUIPMENT CO., LIMITED

**1111 Beaver Hall Hill Montreal, P. Q., Can.**  
Representing  
Industrial Brownhoist Corp.  
Orr & Sombower, Inc.  
Barnes Manufacturing Co.  
Cleveland Tractor Co.  
Prink Snow Plows  
Rotary Snow Plows  
Austin Manufacturing Co.  
Butler Bin Co.  
Hercules Motors Corp.  
New England Road Machy. Co.  
Gardner-Denver Co.  
Marion Steam Shovel Co.

## GENERAL CONSTRUCTION MATERIAL CO., LTD.

**1194 Stanley St. Montreal, P. Q.**  
Sole Agents in Quebec Province  
BAY CITY—Electric and  
Gasoline Shovels  
"A. W."—Traffic Treads for  
Bridges  
"SOLVAY" Calcium Chloride  
MARMON-HERRINGTON—  
Four-wheel and Six-wheel  
drive Trucks  
DIAMOND—Sand & Gravel  
Equipment, etc.  
DYER—Welding Machines—  
Electric  
FREEMAN—Truck Turn-  
tables  
STERLING — Hoists and  
Air Compressors  
SHAW - ENOCHS — Full-  
Type Power Graders and  
Maintainers  
"STELCO"—Snow Fence and  
Steel Posts  
MAINE—Snow Plows for  
Tractors and Trucks  
NEW ENGLAND — Power  
Loaders, etc.  
CARTER—Humdinger Pumps

## HOPKINS-OSBORN LIMITED

**Successors to**  
**F. H. Hopkins & Co. Ltd. and Clare Osborn Ltd.**  
Dominion Square Bldg. 159 Bay Street  
**MONTREAL TORONTO**  
Representing  
FATE-ROOT-HEATH CO.  
Locomotives all types  
ALLIS-CHALMERS MFG. CO.—Tractors  
Industrial Cars  
Locomotive Cranes  
Pile Drivers & Hammers  
Power Drag Scrapers  
Road Finishing Machines  
Road Rollers  
Tractors  
Tractor Dump Wagons  
Track Shifters  
Washing Plants  
Air Compressors and Pumps  
Blast Hole Drills  
Cableways and Derricks  
Chuting Plants, Hatch Bins  
Chameli Bunkers  
Concrete and Truck Mixers  
Crushing & Screening Plants  
Dredging Machinery  
Excavators and Graders  
Hoists and Loaders

## JUST EQUIPMENT & SUPPLY CO., Ltd.

**173 Colborne Street Montreal, Que., Canada**  
Athey Truss Wheel Co.  
Buffalo-Springfield Roller Co.  
Caterpillar Tractor Co.  
E. D. Elyre & Company  
Hi-Way Service Corp.  
AllSteel Products Mfg. Co.  
LaPlant-Choate Mfg. Co.  
National Steel Car Corp., Ltd.  
National Equipment Corp.  
Koehring Div., Parsons  
Div., Kwick-Mix Div.  
Schramm, Inc.  
American Tractor Equip.  
Lenhart Wagon Co.  
Hardsoog Wonder Drill Co.  
Northern Conveyor & Mfg. Co.  
Pittsburgh-Des Moines Co.  
of Canada, Ltd.  
Killefer Mfg. Co.  
Detroit Harvester Co.  
Williamette-Ersted Co.  
Master Equipment Co.  
Brookville Locomotive Co.  
Sanford Day Iron Works  
Miami Trailer-Scraper Co.  
The W. K. M. Company  
The Buda Company  
Highway Trailer Co.  
Pioneer Gravel Eq. Mfg. Co.  
Contractors Mach. Corp.  
Blaw-Knox Company  
Insley Manufacturing Co.  
Euclid Road Machy. Co.  
C. H. & E. Mfg. Co.  
Ward Plow Company  
Wood Hydr. Hoist & Body Co.

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make this Directory of Dealers in construction equipment the most complete and accurate of its kind. Therefore, we would greatly appreciate any suggestions or corrections that you may have to offer.

## CONTRACTORS AND ENGINEERS MONTHLY

470 Fourth Avenue New York

## THE ALBERT OLSON CO. LTD.

**1148-50 Osler Street REGINA SASKATCHEWAN CANADA**  
Representing  
"CATERPILLAR" Tractors  
"CATERPILLAR" Road Equipment  
"CATERPILLAR" Combined Harvesters  
TONCAN Metal Culverts  
PIONEER Gravel Equipment  
LENHART Dump Wagons  
LAPLANT-CHOATE Equipment  
KILLEFER Scrapers  
EUCLID Equipment  
P. & H. Shovels and Cranes

## TRUCK & TRACTOR EQUIPMENT CO., LTD.

**661 Queen St., E. Toronto, Canada**  
Representing  
Hughes-Keenan Co.  
Trackson Co.  
W. A. Riddell & Co.  
Universal Power  
Shovel Co.  
Taco Governor  
Fordson Tractors  
Sargent Snow Plows  
Osgood Co.  
Trucktor Corp.  
Hughes-Keenan Iron  
Mules  
Olson Extensions  
Rock Hand Hoists  
Perry Scraper Co.  
Kingham Trailers  
Brookville Locomotives  
General Excavator Co.  
Trojan Road Rippers  
Bates Tractors  
Willette Mfg. Co.

## MEXICO ARIZONA TRADING CO., S.A.

**Nogales, Sonora Ciudad Obregon, Sonora Culiacan, Sinaloa**  
(Export Offices: Nogales, Arizona)

Representing  
"CATERPILLAR" Tractors  
"CATERPILLAR" Harvesters  
"CATERPILLAR" Road Machinery  
WILLIAMETTE-ERSTED Hoists  
VENTURA Scarifiers and Implements  
ATECO Bulldozers  
BEACON Implements  
TOWNER Tools and Implements

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# NATIONAL CARBIDE V-G LIGHTS

## HELPED BUILD THE GOVERNMENT CONSTRUCTION RAILROAD

from Boulder  
City to

HOOVER  
DAM SITE

Used by  
LEWIS  
CONSTRUCTION  
COMPANY



8000 C. P.

for 12 hours

NATIONAL  
CARBIDE

V-G LIGHT

PORTABLE DAYLIGHT  
NO WASTE

National Carbide Lights are the ideal source of high power, economical lighting—not only for general construction work but also for water companies, shipyards, quarries, railroads, tunnels, subways, telephone companies and municipalities. One of their chief advantages is the ease and convenience of recharging with handy CARBIDE. You always know exactly how long they will run at maximum. Fresh CARBIDE can be put in in a few minutes. . . No wires, etc., to connect or trip over, no matter where you put them and this light is not easily overturned. For their tremendous light volume they are lighter in weight.

National Carbide V-G Lights mean most white light from least carbide—no waste-matter to be paid for or left over. No excess carbide in water to heat it up and make flame red.

No waste carbide, whether used intermittently or continuously. They have proved their safety, economy and efficiency.

Write for Booklet "Lights" on complete line of V-G Lights, V-G Handy Light and National Carbide Lantern. A Light or Lantern for every purpose.



Send  
for  
Illustrated  
Booklet  
"Lights"

NATIONAL CARBIDE  
SALES CORP.

Lincoln Bldg., New York



X-100  
showing  
extension  
for the  
BIG JOB



Y-199 where a  
powerful handy light  
is needed



WLI-CI  
National Carbide  
Lantern

Specify  
National Carbide  
RED DRUM  
Coast to Coast  
Distribution





# JOBS you will point to— not your competitors



Every paving job you construct now is going to be pointed out one, five, ten years from now—by you, or by your competitors.

If the job stands up, it will be you who calls attention to it. If it is a failure, your competitors will see that it is not overlooked.

Ten, fifteen and twenty-year-old TEXACO Asphalt pavements throughout the country today are an important aid to the contractors who constructed them, in securing new contracts.



Chicago  
Cleveland  
Kansas City  
Houston  
Dallas  
Buffalo  
New York  
Philadelphia  
Richmond  
Boston  
Jacksonville

## TEXACO asphalt

THE TEXAS COMPANY, *Asphalt Sales Department*  
135 East 42nd St., New York City

MONTHLY

